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Middleton Goldsmith Lecture

BY

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*ACUTE PANCREATITIS WITH AN ESPECIAL
CONSIDERATION OF PANCREATIC
HEMORRHAGE, HEMORRHAGIC PAN-
CREATITIS, AND SUBPERITONEAL FAT
NECROSIS*

ACUTE PANCREATITIS.

A CONSIDERATION OF PANCREATIC HEMORRHAGE, HEMORRHAGIC, SUPPURATIVE, AND GANGRENOUS PANCREATITIS, AND OF DISSEMINATED FAT-NECROSIS.

PART I.

UNTIL the time of Clässen² the evidence of an acute inflammation of the pancreas was almost wholly theoretical, and was not controlled by any considerable number of anatomical observations. Mercury was known to produce salivation, and the watery diarrhoea following its use was supposed to be due to irritation of the pancreas.

Influenced by this and other considerations, Schmack-pfeffer,³ having found certain alterations of the pancreas in a syphilitic woman who had been liberally treated with mercury, attributed her symptoms to the pancreatic changes. The latter he regarded as anatomical evidence of an acute inflammation. He describes⁴ these changes as follows : "The pancreas was unusually dense, dry, and very much swollen ; it was inflamed and red throughout, although more in the right than in the left side. Numerous drops of blood escaped from the cut surface. The duct was very much dilated, especially at its mouth. The gland weighed 5½ ounces.

Some years later Neumann⁵ stated that "death might take place within a few hours from a fatal metastasis of the buccal salivation to the pancreas. This happens when, in the midst of profuse salivation, the pulse sinks and quickens or the swelling of the salivary glands subsides and salivation is replaced by a green diarrhoea, while the skin is dry and shrunken." Under such circumstances the pancreas is found decidedly swollen, although but slightly reddened.

Clässen⁶ knows of no observations in confirmation of Neumann's statement, and doubts its truth. He collects, however, a half-dozen cases, among them Schmack-

² Die Krankh. d. Bauchspeicheidr., 1842.

³ Diss. inaug. de quibusd. Pancreatis Morbis, 1817, 26.

⁴ Op. cit., 25.

⁵ Von den Krankh. des Menschen, Berlin, 1836 ; Clässen, op. cit.,

192.

⁶ Op. cit., 193.

pfeffer's, of what he regards as fatal pancreatic inflammation, and from them he establishes the symptomatology of acute pancreatitis. The views thus obtained have essentially prevailed up to the time of Friedreich's article in Ziemsser's "Cyclopædia" in 1875.

The lesions found were as follows : In the second case, that of Juppin⁷ "a section was made through the pancreas. Its tissue was dense and friable. It was a third larger round than normal ; it encircled two-thirds of the duodenum, which it compressed, and it affected the pylorus also. . . . The pyloric opening was almost entirely closed, and the tip of the little finger could be introduced only with great difficulty and after repeated efforts. A vertical section through the pylorus showed it to be of almost cartilaginous density."

The third case is credited to Casper.⁸ "All the organs of the remarkably handsome, though excessively fat, body were wholly normal with the exception of the pancreas. This was swollen to the size of a large fist, of cartilaginous density, firmly united to the duodenum, and in part to the stomach, and was of a brownish-red color. Its structure was not recognizable."

The fourth observation is also from Casper.⁹

"The pancreas was so much enlarged that its head was a half hand's-breadth wide, much infiltrated with blood, very dense, its structure not recognizable. In consequence of the enlargement of the gland its shape was more globular than round."

Rahn¹⁰ is the authority for the fifth case. The stomach was dilated "almost to bursting," and was filled with clotted blood. "In the middle of the abdomen there projected from the abdominal aorta a dense, scirrhouus tumor as large as the fist. It was intimately united to the aorta, and so compressed it that when the aorta was opened the finger would not pass through the narrowed canal. The narrowed portion was immediately below the origin of the coeliac artery. On close examination of the tumor with reference to its origin, the head of the pancreas was degenerated in this scirrhouus mass, while the left part of the gland was in a wholly healthy state."

The sixth case is from Morgagni.¹¹ "The pancreas was unusually large, and contained round, tolerably large tumors of a density somewhat approaching that of cartilage."

⁷ *Journ. de méd. chir. pharmac.*, 1791, lxxix., 73; Clässen, p. 200.

⁸ *Wochenschr. f. d. ges. Heilkde.*, 1836, 437; Clässen, op. cit., 207.

⁹ *Wochenschr. f. d. ges. Heilkde.*, 1836, 439; Clässen, op. cit., 213.

¹⁰ *Schirrhosi Pancreatis Diagnosis*, 1796, obs. 1; Clässen, op. cit., 218.

¹¹ *De Sedibus et Caus. Morb.*, 1765, iii., Epist. xxx., art. 10; Clässen, op. cit., 212.

To these is added another, possible, case from Lieutaud,¹² in which, after an acute attack of gastric pain, fever, vomiting, anxiety, and frequent fainting, "the pancreas was found much enlarged, hard, and scirrhouous throughout. The left kidney was in a state of liquefaction."

The first case may have been one of mercurial poisoning; the second was one of probable malignant disease. The third and fourth are possibly of inflamed pancreas, but the evidence is insufficient to clearly establish the diagnosis. The fifth case may have been one of aneurism, while the last two are more suggestive of malignant disease than of acute pancreatic inflammation.

The common symptoms were deep-seated pain near the stomach, producing a peculiar anxiety, restlessness, perhaps frequent fainting. The pain bore no definite relation to the vomiting or other symptoms, and was not increased in proportion to external pressure. The vomiting was forcible, more or less greenish material being expelled. The abdomen was moderately tense, there was slight fever, and the appetite was but little disturbed and might be increased. There was a moist tongue, thirst, and constipation.

The effect of Clüssén's treatment of the subject may be seen nearly thirty years later in the statement by Wardwell¹³ that the prominent symptoms of acute pancreatitis are deep-seated, dull, epigastric pain, distention, sickness, and vomiting of a clear, greenish, viscid fluid; thirst, faintness, moist tongue, constipation, and slight pyrexia.

The first step toward an essential modification of these views was made by Klebs, in 1870.¹⁴ He preferred to say nothing about inflammation of the pancreas, but described the various lesions which have been found in and around this gland, without attempting to show their possible relations to each other. He availed himself of the cases published by Portal, Hooper, Löschner, Haller, and Klob, and of one in his own experience, to associate pancreatic hemorrhage with severe symptoms and to recognize the possibility of a hemorrhagic inflammation of the pancreas, already admitted by Rokitansky,¹⁵ as a very rare occurrence. Klebs further recognized that this hemorrhagic inflammation might possibly result in a purulent peripancreatitis with partial sequestration of the gland.

Friedreich,¹⁶ however, undertook to present a complete picture of acute pancreatitis more in accordance with the

¹² Hist. anat. Med., 1767, i., obs. 1021.

¹³ Reynold's Syst. of Med., 1871, iii., 414.

¹⁴ Handb. d. path. Anatomie, 1876, i., 2, 553.

¹⁵ Lehrb. d. path. Anat., 3te Aufl., 1861, iii., 309, 242.

¹⁶ Ziemssen's Handb. d. Path. und Therap., 1875, viii., 2.

anatomical treatment of Klebs than with that of Clässen. He availed himself of the cases used by Klebs; in addition, of one reported by Oppolzer, and of another under his own observation. He suggested that acute pancreatitis was either primary or secondary. The former appeared to have a tendency to hemorrhage in the pancreas or in its vicinity, in which case a termination in gangrene and ichorous peripancreatitis might occur. If the acute pancreatitis became suppurative, multiple, minute abscesses were to be found, which tended to become confluent and to produce a resulting peritonitis.

The secondary variety of acute pancreatitis was either the granular degeneration found in infective diseases, or the circumscribed "metastatic" abscess. The possibility of a metastatic pancreatitis in the course of a parotitis was not to be absolutely denied, especially in virtue of the case reported by Schmackpfeffer.¹⁷

As there is a doubt of the existence of a pancreatitis in the case, it may be safely stated that there is no reason for admitting the existence of a metastatic pancreatitis secondary to inflammation of the parotid gland. It is evident¹⁸ that an acute parotitis may arise during the course of a pancreatic inflammation. This single instance of association is presumably analogous to the occurrence of parotid inflammation in septic conditions of various origin.

Since Friedreich's anatomical recognition of an acute pancreatitis was based upon the consideration of four cases, he admitted his symptomatology of this affection to be neither precise nor complete. Furthermore, he seems¹⁹ to include under the head of pancreatic hemorrhage those cases where this lesion is associated with necrosis and gangrene, and others where hemorrhage into the pancreas appears to be the sole cause of sudden death.

Klebs²⁰ had already recognized the existence of a suppurative peripancreatitis, and stated, presumably from his own observation, that in most instances this proceeded from lymph-glands. These were either the seat of metastatic abscesses or were primarily diseased by traumatic agencies or injurious food. Such abscesses were regarded as occasional causes of thrombosis of the mesenteric and portal veins. He recognized a possible eventual separation of the pancreas from surroundings by the extension of the suppurative process.

He thought it possible that the case of Haller and Klob,²¹ already admitted as of hemorrhagic pancreatitis, might belong to this series, and regarded that reported by Gendrin²² as illustrative.

¹⁷ P. I. ¹⁸ Case LVIII.

¹⁹ Op. cit., 273.

²⁰ Op. cit., 556.

²¹ Case LVI.

²² P. —.

In the light of the observations published up to the time of his article, Klebs regarded as of doubtful existence any pancreatic abscesses which did not arise from a peripancreatitis or from a suppurating cyst.

Important evidence as to the possible method of origin of a peripancreatitis was furnished by Chiari,²³ who found a round ulcer of the stomach communicating with the cavity of the omentum. The latter contained a spacious abscess with several openings into the jejunum. Lying free within this cavity was a shreddy mass of tissue, 12 ctm. long. It was brownish black, friable, and presented the structure of the pancreas.

Four years later, Chiari published the report of a case²⁴ by Schlossberger, in which the sloughing pancreas was discharged through the bowels. He reported still another²⁵ of earlier occurrence, in 1862. The sloughing pancreas, discharged from the bowels, was brought to Rokitansky by Trafoyer.

The next communication of especial importance in connection with the subject of pancreatic inflammation is that of Balser.²⁶ He calls attention²⁷ to the presence of nodules and patches of necrotic fat-tissue in the mesentery and in the contents of a cavity behind the mesentery. In the latter lay the pancreas also, attached to the duodenum, and its lobules appearing as if macerated. A second case was reported by him,²⁸ in which there were patches of necrosis of the abdominal fat associated with similar appearances in the pancreas. In addition, there was evidence of old and recent hemorrhage in the gland.

My own interest in this subject was first particularly aroused in 1876. At the request of Dr. J. P. Maynard, of Dedham, Mass., I made the post-mortem examination of a lady of uncertain age, not especially fat, who fell on the floor while apparently in her usual good health. She died within thirty minutes. In the meantime she complained of pain in the lower part of the chest. Her respiration became hurried, the pulse feeble; a short convulsion occurred, and death took place. The abnormal appearances found were several nodules and patches, the largest of the volume of a walnut, of freshly extravasated blood at the periphery of the posterior portion of both lower pulmonary lobes. There were several patches, of considerable size, of submucous hemorrhage near the ileo-caecal valve along the mesentery. The pancreas was thin and very flaccid, with occasional slight, subperitoneal hemorrhages. Section through the organ showed similar

²³ Case LVIII.

²⁴ Case LIX.

²⁵ Case LVII.

²⁶ Virchow's Arch., 1882., xc., 520.

²⁷ Case LXIV.

²⁸ Case XXIV.

hemorrhages in its substance. The gland-lobules were of a reddish-gray color, the general surface spotted with white specks. Microscopic examination showed extensive fatty degenerations of the gland-cells; many fat-drops, being exceedingly minute. The interstitial fat was frequently crystallized, and at times bundles of orange, acicular crystals (*haematoxin?*) were found.

The cœliac plexus was examined, and nothing abnormal found. The heart was contracted; its cavities contained mainly fluid blood. The mesenteric veins near the cæcum were injected. The liver and kidneys were injected; the spleen and suprarenal capsules were normal. Nothing abnormal was found in the brain or heart. It was considered, at the time, that the history of the case and the appearances found were best explained on the ground of Zenker's communication,²⁹ which will be soon referred to more particularly.

Since then it has been my opportunity, largely owing to the zeal of Drs. Gannett and Whitney, to have seen at least a dozen examples of pancreatic hemorrhage, with or without necrosis of fat-tissue, and of necrosis of fat-tissue without pancreatic hemorrhage. I have been present at several of the post-mortem examinations at which the diseased pancreas has been found, and have demonstrated to the students of the Harvard Medical School many of the specimens which have been removed by my friends and colleagues.

Having thus been impressed with the importance of the subject, I take this opportunity of utilizing the material which has been gradually accumulated by Dr. W. F. Whitney, the curator of the Warren Anatomical Museum. The value of this material is greatly enhanced by the records of the clinical course of the disease in question, which have been furnished by those in charge of the patients. In addition, a collection of similar cases has been gathered from medical literature, which of late years has been especially prolific in this subject.

This paper will include a consideration of :

The liability of the pancreas to hemorrhage ;

The association of hemorrhage with acute pancreatitis ;

The occurrence of acute pancreatitis without hemorrhage ; and

The relation of acute pancreatitis to fat-necrosis.

PANCREATIC HEMORRHAGE.—Although Klob³⁰ regarded interstitial pancreatic hemorrhage as not rare, he found it only, and then not constantly, in extreme portal stagnation.

²⁹ Deutsche Zeitschr. f. pr. Med., 1874, ii., 351.

³⁰ Oesterreich Zeitschr. f. pr. Heilkde., 1860, v., 529.

Spiess,³¹ however, in 1866, reported to the Frankfort Medical Society a case³² of sudden death due to an extensive interlobular, pancreatic hemorrhage. His observation, though unique, escaped attention.

Klebs, as already stated (p. 198), had associated pancreatic hemorrhage with severe symptoms, and suggested that the hemorrhage might be due, in the absence of inflammatory changes in the interstitial tissue, to the corrosive action of the pancreatic secretion.

Zenker³³ then reported three cases as of fatal pancreatic hemorrhage. This lesion, however, existed in only two of them,³⁴ while in the third the hemorrhage was near the pancreas, in the hilus of the spleen. In this last case, and in one of the others, there was a striking venous injection of the solar plexus. He regarded this as the immediate cause of the sudden death, in accordance with the results of Goltz's experiment of cardiac paralysis by a blow on the frog's abdomen. He found in one of his cases a flabby heart with distended, empty cavities associated with marked injection of the abdominal organs, as in the frog experimented upon.

Prince³⁵ then published a paper on this subject, and Draper³⁶ reported a series of cases of sudden death from pancreatic hemorrhage.

Virchow,³⁷ however, in most recent times, has stated that nothing is more rare than hemorrhage in the pancreas.

The relative frequency and absolute importance of pancreatic hemorrhage is thus, unquestionably, a discovery of very recent origin. There are, however, a considerable number of recorded cases which show that sudden and unexpected death may occur, and a conspicuous hemorrhage be found in or near the pancreas as the sole significant lesion. Such hemorrhages may occur in a previously diseased pancreas or individual, or it may take place when the person is apparently in his usual health, and the pancreas gives no evidence of any acute disease.

Both groups illustrate the liability of the pancreas to hemorrhage, but the conditions of its occurrence must vary in each.

In the first series, the hemorrhage is associated with certain lesions of the pancreas of a chronic character. The earliest case of this sort, and one which has been quoted in evidence of pancreatic hemorrhage as a cause of sudden death, is that of Störck.³⁸

³¹ Schmidt's Jahrb., 1867, cxxxiv., 270.

³² Case I.

³³ Loc. cit.

³⁴ Cases III. and IV.

³⁵ Boston Medical and Surgical Journal, 1882, cvi., 28.

³⁶ Trans. Asso. Am. Phys., 1886, i., 243.

³⁷ Berl. klin. Woch., 1887, ix., 155.

³⁸ Annus Med. Second, 1762, 245.

A woman, aged twenty-eight, during the catamenial period, was seized with severe vomiting. The flow was arrested; chills, dyspnoea, and palpitation followed. Although she gradually improved, an epigastric pulsation became apparent, synchronous with the heart beat. After the next menstrual period this pulsation became more severe, and a resistant pulsating tumor could be felt below the stomach. The tumor increased in size, and there was a sense of weight in the epigastrium. During the subsequent three and a half months the symptoms improved, the palpitation became less, and the tumor smaller and softer. Sudden weakness then occurred, there was a rust-colored vomit, bilious stools, sudden increase in the size of the tumor, rapid emaciation, and death.

The pancreas was found so large and heavy as to weigh thirteen pounds. It formed a sac filled with blood, partly grumous and partly laminated. The stomach, intestines, and omentum were displaced and compressed.

The evidence here presented is not sufficient to exclude the possibility of the chief lesion in this case being an aneurism of some artery in the vicinity of the pancreas. If Störck's view be accepted that there was a hemorrhage within the pancreas, we have merely an illustration of what has been repeatedly found since his time, namely, hemorrhage into a pancreatic cyst.

The first indubitable case of this sort on record is to be found in the museum of the Harvard Medical School. It was published by Gross³⁹ from the MSS. furnished by Dr. J. B. S. Jackson, and has also been published by the latter.⁴⁰

For several months before the patient's death a tumor was noticed in the epigastric and right hypochondriac regions. There were also signs of advanced phthisis. The patient sat up every day until a short time before his death. The day before this took place he was found partially comatose. The tumor was a cyst of the pancreas, containing from ten to fourteen ounces of bloody-looking serous fluid without coagula.

The conspicuously hemorrhagic contents of pancreatic cysts have been also noticed by Anger,⁴¹ Küster,⁴² Bull,⁴³ Kocher,⁴⁴ Wölfler,⁴⁵ Hagenbach,⁴⁶ and Steele.⁴⁷ The case

³⁹ Elements of Path. Anatomy, 1839, ii., 209.

⁴⁰ Catalogue of the Museum of the Boston Med. Improvement Soc., 1847, 174.

⁴¹ Bull. Soc. Anat. de Paris, 1865, xl., 92.

⁴² Berliner klin. Woch., 1887, ix., 154.

⁴³ New York Medical Journal, 1887, xlvi., 376.

⁴⁴ Corresp. bl. f. schweizer Aerzte, 1888, 279; British Medical Journal, 1888, i., 1297.

⁴⁵ Zeitschr. f. Heilkde., 1888, ix., 119.

⁴⁶ Deutsche Zeitschr. f. Chirurgie, 1888, xxvii., 110.

⁴⁷ Chicago Medical Journal and Examiner, 1888, lvi., 205.

reported by Pepper⁴⁸ as one of fatal hemorrhage from a pancreatic cyst admits of another explanation. The patient, an intemperate man, had frequently recurring intestinal hemorrhages for six months. He had two attacks of bloody vomit within five weeks, and finally an attack of gastro-intestinal hemorrhage, proving fatal in an hour. The blood came through an opening in the duodenum, a half-inch in diameter, near the common duct. A probe, passed through the opening, entered a cavity in the head of the pancreas of the size of a walnut. Its walls were trabeculated, but "everywhere covered by a smooth mucous membrane;" numerous crystals of haematin were lying on the surface. "But little of the proper gland-tissue was to be seen in this part of the organ, its place having been apparently usurped by dense fibrous tissue. The same state of affairs is also observable in the body and tail of the gland, although in a less marked degree." It seems more probable, from the symptoms in this case, the seat of the cavity, the nature of the duodenal opening, and the history of pancreatic cysts, that this was rather a case of perforating duodenal ulcer with corrosion of the pancreas than of pancreatic cyst opening into the duodenum.

Doubts are also to be entertained concerning Rugg's case,⁴⁹ reported as one of fatal hemorrhage from the pancreas. In 1843 he had a male patient, thirty-two years of age, who was rapidly recovering from a severe attack of acute rheumatism, but was up and dressed on the day before his death. He had frequently complained of severe pains in the epigastrium, but these had left him a few days before his death, and were replaced by acute pains in the left lumbar region. He was suddenly seized with agonizing pain in the latter place. His countenance became anxious, his lips pale, pulse imperceptible, skin cold and sweating, and death took place in an hour. The pancreas was somewhat larger and harder than usual, and had a cavernous rupture in its anterior surface, having all the appearance of an excavated ulcer. Its cavity contained a bloody substance, about the size of a walnut, in concentric layers. On longitudinal section of the organ several of these sanguineous deposits were found, varying in size from that of a horse-bean to a hazel-nut, in appearance like aneurismal deposits. A large quantity of blood was extravasated over the left kidney. The probability of this case being rather one of aneurismal than of pancreatic hemorrhage is very strong.

Finally, the somewhat irregular case of pancreatic hemorrhage reported by Satterthwaite⁵⁰ may be men-

⁴⁸ Proceedings Phila. Path. Soc., 1870, iii., 182.

⁴⁹ Lancet, 1850, i., 608.

⁵⁰ The Medical Record, 1875, x., 541.

Sixteen Cases of Pancreatic Hemorrhage.

No.	Authority.	Sex.	Age.	Antecedents.	Symptoms.	Lesions.
I.....	Spies, I: Schmidt's Jährb., cxxxiv., p. 270. 1867.	M.	Adult.	.....	Sudden death.....	Extensive interlobular, pancreatic hemorrhage and considerable hemorrhage behind the pancreas and spleen, between the peritoneum and abdominal wall.
II.....	Klebs: Handb. d. Path. Anat., pp. 1, 2, 555. 1870.	.....	.....	.....	Unexpected death.....	Extravasation of fresh blood in the pancreas, no interstitial inflammatory changes, no thrombosis of large vessels near pancreas.
III.....	Zenker: Deutsche Zeitschr. f. prakt. Med., ii. p. 351. 1874.	M.	48	Very fat. Heart disease in early life. Previous pulmonary disease. Three years ago slight digestive disturbance.	Awoke suddenly at night; unwell, desire to defecate, got out of bed, slight tendency to vomit. Returned to bed. Immediate death.	Entire pancreas of an intense, bloody color, and so fatty infiltrated that only fatty debris was visible. Slight cardiac aneurism, not in such a condition as to be accused of causing sudden death.
IV.....	Zenker: Loc. cit.	M.	.....	Drunkard	Found dead in the water. Well on the same day.	Hemorrhagic infiltration and fatty degeneration of the pancreas.
V.....	Maynard and Fitz: MS. Notes, V., p. 26. 1875.	F.	Adult.	In usual health.....	Sudden pain in lower chest. Hurried to respiration, feeble pulse. Death in a half-hour.	Thin, flaccid pancreas, with slight subperitoneal and intra-glandular hemorrhages. Cut surface dotted with white specks. Extensive fatty degeneration of gland-cells. Fatty crystals, and blood-crystals. Nothing abnormal in celiac plexus.
VI.....	Kollmann: Aerzl. Intell. Bl., xxvii., p. 427. 1880.	F.	Adult.	Mitral stenosis. Pleurisy in left chest. Frequent abdominal pain. Able to work.	Injected pancreas surrounded as far as the spleen with extravasated blood. Hemorrhage in mucous membrane of the duodenum. Four hundred grammes of yellow fluid in left chest; one hundred grammes in the pericardium. No appearance of fatty degeneration of the pancreas.	
VII.....	Gerhardt: V. Kollman, loc. cit.	F.	47	Bronchial catarrh, emphysema, anasarca, ascites, albuminuria, cyanosis.	Died in collapse.....	Inconsiderable interlobular pancreatic hemorrhage. Tissue behind pancreas, as far as the spleen, infiltrated with blood. Duodenal mucous membrane almost black, and peritoneum over its convexity infiltrated with blood. Ecchymosis in mucous membrane of cæcum.

VIII.... Reynolds and Gannett : Boston Med. and Surg. Jour., cxii., p. 275. 1885.	M. 66	Abundant fat tissue	Suffered from epigastric pain and constipation. Pancreas enlarged one-half. Consistency diminished. Cut surface reddish black from much extravasated blood nearly uniformly distributed. Blood-vessels and pancreatic duct unaltered.
IX.... Draper : Trans. Asso. Am. Phys., i., p. 143. 1886.	M. 45	Strong, rugged. Drunk at long intervals.	Found dead in chair, as if asleep. Seen well within forty-eight hours.
X.... Draper : Loc. cit.	F. 44	Addicted to liquor, though rarely drunk.	Pancreas infiltrated with blood. Moderate retro-peritoneal hemorrhage. Eight ounces of thin, red fluid in the peritoneal cavity.
XI.... Draper : Loc. cit.	F. 26	Very fat ; intemperate. Kicked in abdomen a week before death, but afterward appeared in usual health.	Pancreas enlarged, sodden, soft, and slimy, filled with effused blood. Infiltrated blood behind mesenteric peritoneum, behind and below stomach and colon, over right kidney. Twenty-two ounces of thin, red fluid in abdomen. No peritonitis.
XII.... Draper : Loc. cit.	M. 55	Exemplary habits	The abnormally large pancreas uniformly infiltrated with fresh blood. Subperitoneal tissue of each side of the pancreas, for about two inches, filled with blood.
XIII.... Draper : Loc. cit.	M. 31	Intemperate	Pancreas and adjacent tissue infiltrated with blood ; with microscope granular gland-cells, and blood in interlobular tissue.
XIV.... La Fleur : Medical News, liii., p. 80. 1888.	M. 50	Obscure dyspepsia for several years.	Pancreas doubled in size, dark-red, firm. The cut surface mottled with capillary hemorrhage, separated by a grayish-red, translucent material. Fatty degenerated tubules and acini. Cellular tissue around pancreas blood-stained.
XV.... Driver and Holt : MS., Notes, v., p. 32. 1888.	M. 58	At a dinner party the night before his death. Thin.	Duodenal half of the pancreas infiltrated with blood. Each side of the heart contained a little fluid blood.
XVI.... Williams : MS. Notes, v., p. 55. 1888.	M. 70	Thin; temperate. Always Sudden epigastric pain, vomiting, collapse. Death within one-half hour.	Tail of pancreas infiltrated with blood. Slight mesenteric hemorrhage. No evidence of peritonitis.

tioned. The patient, a man, thirty-six years of age, intemperate, syphilitic, had three attacks of jaundice in eight years. The last began five months before, and continued until his death. Toward the end of life he had a persistent bleeding from the lip, frequent intestinal hemorrhages, and constant drowsiness. The pancreas was distended beyond the usual size by a clot of blood. There was an extravasation of blood between the coats of the upper part of the ileum. The symptoms in this case are so different from those occurring in immediately fatal pancreatic hemorrhage, or in hemorrhagic pancreatitis, that the hemorrhage may best be attributed to the jaundice, like that from the lip and from the intestine. The pancreatic localization of hemorrhage in jaundice is exceptional, but need not be unexpected.

There remains, then, the following series of sixteen cases where pancreatic hemorrhage was apparently the sole cause of sudden and unexpected death, in persons not presenting evidence of other causes of death. Nine of them have occurred in or near Boston, and three of these are now for the first time published.

The following more detailed report of Case XV. is compiled from notes sent by Dr. Holt, of Cambridge, who made the post-mortem examination.

The patient, aged fifty-eight, was a gentleman of leisure, thin, white-haired, his body looking like that of a considerably older person. He was at a club-dinner the evening before his death.

He awoke about two o'clock the following morning, complaining of severe pain in the bowels, nausea, and great prostration. He was pale, and his pulse was very weak. He soon vomited, became collapsed, and died within half an hour.

The duodenal half of the pancreas was of a bluish red color, and was sharply contrasted with the yellowish-gray splenic end. The darker portion was infiltrated with blood, which lay in the interlobular tissue, and could be readily squeezed from the cut surface.

Nothing abnormal was found in the brain. Both sides of the heart contained a little fluid blood; the valves, cavities, and muscular substances appeared normal. The stomach was empty, and in the intestines were the products of digestion. The liver was normal in size and appearance, and the cortex of the kidneys was paler than the pyramids.

I am indebted to Dr. Williams, of Charlestown, Mass., for the notes of Case XVI., which occurred in his practice. It is included in the series, with the full recognition that it is open to criticism, since the post-mortem examination was necessarily partial and hurried.

The patient, a man, aged seventy, was a night watchman. His health had been good, and he had wholly abstained from liquor since early manhood.

In the evening he was suddenly seized with colicky pain in the epigastrium. After five hours the pain was almost constant, sharp, and cutting, extending toward the left, and downward nearly to the navel. The abdominal muscles, especially the recti, were very rigid. There was a slight, circumscribed, epigastric swelling at the left of the median line, extending from the costal margin to the navel. It was non-resistant and not sensitive to pressure, which rather relieved than increased the abdominal pain.

There had been vomiting of a yellowish fluid. The pulse was 95, regular, small, the radial and temporal arteries were rigid, the skin dry and not cool. The vomiting persisted, and in six hours the patient was collapsed, but conscious. He then became restless, the pain was less agonizing, and death took place sixteen hours after the beginning of the attack.

Dr. Williams' diagnosis was pancreatic hemorrhage.

After death he was allowed to make an incision over the tumor, and found the pancreas enlarged from the median line of the body to the splenic end of the gland. The enlarged portion was more easily cut than the rest and infiltrated with blood. On section, two or three ounces escaped into the peritoneal cavity. Slight mesenteric hemorrhages had occurred. There was no evidence of peritonitis, nor was any blood found in the peritoneal cavity before the pancreas was incised.

The following case, reported by Zenker,⁵¹ is not inserted in the table, since it is not, strictly speaking, one of pancreatic hemorrhage, though important in suggesting the possible manner of death in this affection.

A man, aged twenty-eight, strong, very fat, and epileptic, was found dead, having been seen alive an hour before. There was a hemorrhagic infiltration in the hilus of the spleen and a venous hyperæmia of the solar plexus. The abdominal organs were strongly injected and the pancreas was fatty degenerated.

A consideration of the table on p. 203 shows that most of the individuals concerned were in their usual health at the time of the attack, or when last seen alive. They were invariably adults and usually beyond the age of forty, when the age was given. Some were conspicuously fat and strong, while a few were weak and thin. Although several were of intemperate habits, others were not so reported, and two were exemplary in this respect.

Two had complained of previous digestive disturbance, and one suffered from frequent abdominal pain. One had received a kick in the abdomen a week before death.

From the evidence here collected there is evidently nothing in sex, habits, condition, or exposure which will indicate the likelihood of pancreatic hemorrhage.

The cases and data are insufficient in number and detail to permit an exact clinical picture of this affection which shall be of especial value in a differential diagnosis.

We learn that pain was an early symptom in nearly one half of the cases; that it was usually severe, and might be intense, and was to be found in the abdomen or lower chest. Although mention is made of its presence in the epigastrum in one-fifth of the cases, this region is not conspicuously designated as the seat. On the contrary, there may be little or no pain, or merely a sense of constriction of the chest. Nausea or vomiting is but occasionally mentioned; constipation or a desire for frequent stools is still more rarely noted.

The most constant symptoms are those of collapse, and are more or less intense and more or less prolonged.

Death may take place within a half-hour after the onset of the symptoms and may be delayed for thirty-six hours. It is questionable in the latter instance whether the case should not, more properly, be included under the head of hemorrhagic pancreatitis than of pancreatic hemorrhage.

The appearances found after death are conspicuously the hemorrhage within and near the pancreas.

The gland may be of normal size, or enlarged, and its density may not be modified, or the pancreas may be flaccid, soft, and friable. The hemorrhagic infiltration is to be found in the subperitoneal tissue around the pancreas as well as in the interstitial tissue of the gland. The former may be continued into the omentum and mesentery, behind the colon and into the perinephritic fat-tissue. The entire pancreas may be infiltrated, or either half, or the central portion alone may be conspicuously involved. The hemorrhage is usually diffused, but it may be in numerous patches, both beneath the peritoneal investment and in the interlobular tissue. The color and moisture of the cut surface indicate that the extravasation is recent. It may take place into a normal pancreas or into one which is either fatty infiltrated, or fatty degenerated, or into one which shows a granular condition of the epithelium.

In a single instance evidence of an older hemorrhage was to be found in the presence of round, orange-colored bundles of acicular crystals. In the same pancreas were

also to be seen colorless, acicular crystals, probably of fat, in clumps visible to the naked eye, corresponding to the appearances to be described under fat-necrosis. The microscopic examinations of one of Draper's cases showed occasional patches of hemorrhage within the lobules, although the infiltration was essentially in the interlobular tissue.

Hemorrhages might also be found in the wall of the duodenum and cæcum, and in the lungs in a single instance.

Although the splenic artery is reported to have been tortuous in one case, there is no evidence in any of a circumscribed aneurism. The splenic vein, when examined, was free from obstruction.

The conditions found by Zenker, viz., injections of the portal venous system and of the capillaries of the solar plexus, with distended and empty cardiac ventricles, were not generally met with.

Fatty degeneration and fatty infiltration of the pancreas were not necessarily present in these cases, and frequently occur without a trace of hemorrhage.

The seat, extent, and rapidity of the bleeding suggest that it is rather arterial than venous, and no evidence of venous obstruction has been found. Such hemorrhages are most likely to be of aneurismal origin, but aneurisms have not been discovered. An embolic source has been sought for in vain. It is possible that the pancreatic secretion may have corrosive properties, as suggested by Klebs, in which case the condition should occur oftener. Suggestive evidence in favor of this view is the fact, well known to demonstrators of anatomy, and called to my attention by my colleague, Dr. Mixter, that arterial injections are likely to break through and escape in the region of the pancreas.

Hemorrhages in a diseased or dead pancreas might be thus explained, but in the great majority of the cases collected there is no sufficient evidence of such disease. It is also possible that the hemorrhage may be of nervous origin, as in the pulmonary infarctions sometimes associated with cerebral lesions.

The only fact in favor of this view is the association of such pulmonary nodules with the pancreatic hemorrhages in one case. This observation, compared with the relative frequency of pulmonary hemorrhages of apparent central, nervous origin, makes the single instance of but little value as evidence.

That fat-necrosis is not a cause for such hemorrhage is obvious from its presence being suggested only in a single instance.

It is evident that the first step toward a more accurate

knowledge of the immediate cause of this affection must lie in a more careful search for the actual source or sources of the leak.

HEMORRHAGIC PANCREATITIS.—In considering the relation of hemorrhage to acute pancreatitis, it is important to agree upon what shall be understood by the latter term.

It has already been shown that the views advanced by Clässen and his predecessors give no aid in this matter. Klebs is non-committal on account of the paucity of evidence, and Friedreich elaborated his systematic description of acute, primary pancreatitis from the consideration of four cases. In the one pancreas were multiple abscesses; in another a bloody exudation, and infiltrated blood in the vicinity; in a third were spots of finely granular, yellow exudation with inter-lobular hemorrhage; while the fourth pancreas was gangrenous.

The material, which has been accumulating since the publication of Friedreich's article, in 1875, is already so considerable and varied as to make possible a more complete description of the subject.

The acute inflammation of a gland, from the anatomical point of view, demands the presence of degenerative changes in the parenchymatous cells, or an exudation in the interstitial tissue, or both these factors.

The first, the parenchymatous inflammation or granular degeneration of the pancreas, such as occurs in infective diseases, or as the result of mineral poisoning, is of no immediate concern. It is the interstitial variety, which, with or without associated parenchymatous changes, may be regarded as the genuine, acute pancreatitis; and it is in the interstitial tissue of the pancreas that the inflammatory exudation is to be sought. But this tissue is both fibrous and fatty, one or the other variety predominating in different individuals, and, perhaps, at different periods in life. These tissues bear a continuous relation to the peritoneum, and to the subperitoneal and retropancreatic fat-tissue. It is, therefore, most probable that an inflammatory process of this fat-tissue might arise within the pancreas, or be continued to the pancreas from some more remote place of origin. Thus a primary and a secondary, acute, interstitial pancreatitis might occur. The results in either case would be the same; the sources and progress of the disease might vary.

Whenever the anatomical evidence is insufficient to establish the diagnosis of inflammation, it is permissible to utilize the symptoms for this purpose. If the general symptoms of inflammation are present and the pancreas is described as infiltrated with blood, such an association of symptoms and lesion is rather classified among the inflammations than among the hemorrhages.

Thus Cases VIII. and XX. have many features in common; the latter, however, is tabulated as hemorrhagic pancreatitis, since it was considered clinically as a case of peritonitis from perforation. The former was placed among the hemorrhages, since the clinical picture was not that of an inflammatory process.

The series of cases which form the basis of this part of the subject naturally fall into three groups.

In the first hemorrhage is conspicuous, in the second suppuration, and in the third gangrene.

These may be designated respectively as hemorrhagic, suppurative, and gangrenous pancreatitis.

Before calling attention to the first of these groups it is desirable to exclude certain cases which have been regarded as possible illustrations of a hemorrhagic pancreatitis. Fearnside⁵² reported the case of a man, aged forty-nine, not remarkably temperate, but who had enjoyed good health till within a year, since which time deep-seated pains in the region of the stomach had existed, with occasional heat or coldness in the same region, gastrorrhœa, pyrosis, constipation, pallor, and loss of flesh. For three months before death the pains became more severe and frequent, eventually constant, generally most distressing a few hours after food. Three days before death a sudden excruciating pain occurred, followed by jaundice and a dark-brown vomit. On the following day there was intermitting vomiting, and frequent hiccough. On the day of his death he was collapsed, although his intelligence was good. The epigastric pain was severe, and on pressure between the navel and the ensiform cartilage a deep-seated transverse tumor could be felt. The pancreas was four times the normal size, and was adherent to the stomach by some firm adhesions. The neighboring peritoneum showed spots of soft and firm exudation. The greatest increase in size was in the head, which extended deeply into the right lumbar region. It was blackish-brown, pultaceous, grumous, and contained distinct blood-clots. In the more consistent portions there was no trace of natural gland-tissue. The body was firm and close in texture, of a dark-red color mottled with black lines and points, and became paler toward the tip.

The probability of this being a case of malignant disease with hemorrhage is very strong, especially as the appearances do not correspond with those to be stated later as found in hemorrhagic pancreatitis.

Rigal⁵³ reports the case of a man, aged fifty-two, pre-

⁵² London Medical Gaz., 1850, xlvi., 967.

⁵³ Gaz. des Hôp., 1869, xlii., 562.

viously in perfect health, who suffered for seven days from intermittent fever, daily, with short remissions. The abdomen and legs then became swollen, and some pain was complained of at the right of the navel, where was a sensitive, indurated spot. Jaundice then occurred, also progressive weakness, and epistaxis. Finally fever was noticed, and death took place about seven weeks from the beginning of his sickness. The pancreas was large, the head being twice the normal size. The latter was brown, both on inspection and section. On microscopic examination there was advanced fatty degeneration, and numerous crystals of margarine were seen. There was also fatty degeneration of the right kidney, and an enlarged and friable spleen. The liver was normal in size and consistency, the bile-ducks and gall-bladder were dilated.

This case is excluded from the list which is to follow, from the inability to determine the nature of the changes in the head of the pancreas. At the same time it is admitted that certain characteristics are presented which render it not unlikely to have been an instance of the disease under consideration.

The case reported by Huber⁵⁴ must be excluded from those of hemorrhagic pancreatitis. His patient died within twenty-four hours after the onset of an attack of severe epigastric pain. There was a tumor of the head of the pancreas surrounding the common duct, which was passable. The tumor descended into the mesentery. It looked like Förster's carcinoma simplex, but had many pigmented and hemorrhagic spots.

The case of pancreatic hemorrhage reported by Chaliland and Rabow⁵⁵ is also not wholly clear with reference to its relation to pancreatitis.

The patient, sixty-two years of age, an insane woman, and inmate of an asylum, had an ovarian cystoma for several years.

She was found at bedtime pale, and groaning feebly, without known cause. The next day she was collapsed. She complained of suffering, especially in the lumbar and epigastric regions. The pain was not increased on pressure, and there was repeated vomiting. She remained in a condition of extreme weakness, with frequent vomiting and groaning, a quick pulse and a subnormal temperature, till her death, on the fourteenth day. The pancreas appeared doubled in size. On tearing its tissue a certain quantity of thick, black blood escaped. In making a longitudinal section, a cavity as large as the fist was opened, filled with large, black clots. The pancreatic tissue was dark brown, and so softened and friable that it

⁵⁴ Deutsches Arch. f. klin. Med., 1875, xv., 455.

⁵⁵ Bull. Soc. Méd. de la Suisse Romande, 1877, xi., 345.

was impossible to determine the point of origin of the hemorrhage. The duct was moderately dilated, and the tissues in the immediate vicinity of the gland were strongly discolored with blood.

This case is not included among those of hemorrhagic pancreatitis, since the described appearances do not correspond with those usually found, and the possibility of a pancreatic cyst or of an aneurism is not eliminated.

The list of seventeen cases shown in the following table includes the instances of associated pancreatic hemorrhage and inflammation which present common features of symptoms and anatomical changes. Of these cases three have occurred within the vicinity of Boston; two of these are now, for the first time, reported, and the gross and microscopic specimens from the latter are submitted to your inspection.

I am indebted to Drs. Pinkham and Whitney for their notes of Case XXVIII. The patient was a man, forty years of age, by occupation a caterer. He was liable to attacks of acute indigestion, and, for a year or more before his death, had suffered from general malaise and debility. His discomfort was attributed to indigestion. His last illness was of six days' duration, and was characterized by epigastric pain, vomiting, and by great cardiac weakness. Death occurred from heart-failure after the pain and vomiting had ceased.

There was a large quantity of abdominal fat, and the post-mortem examination was negative, with the exception of the appearances described below. The pancreas was very large, weighing, with some adherent fat, four hundred and ten grammes. The cut surface showed everywhere dark-red streaks and patches between the lobules, and separating them to a slight degree. On microscopic examination there was no evident alteration of the gland-cells. A considerable quantity of free blood-corpuscles was found in the intra-lobular tissue. The fat-tissue was everywhere filled with small, opaque-white spots, often with a well defined, dark border. Their diameter varied from a few millimetres to several centimetres. They were present within the pancreatic fat-tissue and in that outside the organ. Microscopic examination showed that the fat-tissue was changed to a finely granular mass in which were numerous very fine acicular crystals. In the vicinity of the patches of necrotic fat-tissue were found colonies of micrococci.

For the purposes of this paper a more extended microscopical examination has been made of the above pancreas.⁵⁶

⁵⁶ Unless otherwise specified, the sections from the specimens hardened in alcohol are made with a microtome, stained in haematoxylin, carmine, or aniline blue or brown, dehydrated, and mounted in glycerine or balsam.

Seventeen Cases of Hemorrhagic Pancreatitis.

No.	Authority.	Sex.	Age. ¹	Antecedents.	Symptoms.	Lesions.
XVII.	Löschner: Weitewer's <i>Beitr. z. Med.</i> , 1842. Schmidt's <i>Jahrb.</i> , 1843, xxxii, 31.	M.	26	Strong, Drinks and smokes. Five years ago, from excesses, attacks of belching, nausea, cardiagia, colic, diarrhea, burning sensation in upper abdomen.	For 16 days colicky attacks in upper abdomen, becoming more frequent. In past 5 days paroxysms of vomiting, constipation, nausea, vomiting, constipation, fever, anxiety, now collapsed. Burning, stabbing, gripping pain from duodenum to spleen, toward navel, back, and right shoulder, most severe along curvature of stomach. No stool for several days. Upper abdomen hot, swollen, sensitive. Death in 8 hours.	Pancreas doubled in size, firm, violet. Lobules much enlarged, dark, injected, interstitial tissue, infiltrated with blood. Here and there in the blood, between the lobules, a finely granular, yellow exudation. Connective tissue around the pancreas swollen, friable, bluish-purple, infiltrated with blood.
XVIII.	Oppolzer: <i>Allg. Wien. Med. Zeit.</i> , 1858, xlv. <i>Mediz. Nenick.</i> , 1859, ix, 105. <i>Wiener. Med. Woch.</i> , 1807, vii, 7.	M.	Adult young	Strong,	Sudden cardiagia, without known cause, becoming violent on strong, epigastric pressure. Constant bilious vomiting, obstinate constipation. High fever, quick pulse, collapse. Death in 3 days or more. No evidence of poisoning. Diagnosis, perforating gastric ulcer.	Pancreas at least doubled in size, dark-red. Hemorrhage between the lobules, and much extravasated blood in the vicinity of the pancreas, between the mesenteric folds.
XIX.	Hooper: Beale's <i>Arch. of Med.</i> , 1860, ii, 282.	M.	44	Active, fat, florid, temperate.	Sudden, severe pain below left breast, nausea, constipation, tympany, weak pulse. 2d day: Black vomit, dejection (alvine), exhaustion. Death in collapse on the third day.	Pancreas enlarged, hard, friable, contained several small, scattered extravasations of blood. The seat of several lobules occupied by large lobules of fatty matter, from which much margarine crystallized out. Very many, small, granular cells in the interval between follicles.
XX.	Hiltz: <i>Corresp.-Bl. f. Schweiz. Aerzte</i> , 1877, vii, 666.	M.	30	Strongly built, fat, fond of spirits. In past few years frequent palpitation and occasional dyspepsia.	Sudden, abdominal fulness and tension attributed to new ber. Anxious, restless, uncomfortable. Feeble pulse, rapid breathing, cold sweat, subnormal temperature. Then abdominal pain, distended, tympanitic, upper abdomen. Nausea. 2d day: Collapse, spontaneous dejection, no fever. Sudden, violent delirium. Diagnosis, peritonitis from perforation. Death in 36 hours.	Pancreas doubled in size, firm, dark-violet. Extensive interfolicular hemorrhagic infiltration. In the head many nodular hemorrhages as large as cherry-stones, marked bloody infiltration of the periampullary tissue.

XXI.....	Guillery: Ueber d. Entz. d. Pankreas. Inaug. Diss., 1879, 26.	M.	Intemperate.....	In delirium tremens for a few days, then death.	Pancreas trebled in size from presence of fat-tissue within and around the gland. Minute hemorrhage in places. Microscopic examination showed hemorrhage between the cells, and a small-celled infiltration in the interstitial tissue. A peripancreatitis with gradual extension into the pancytoma.
XXII.....	Farge: Bull. Soc. de Med., 1880-S2, N. S., viii, 188.	M.	fat, temperate.	Severe abdominal pain, worst in left side on palpation. No vomiting. Subnormal temperature. Abdomen tympanitic, distended, especially below navel. 2d day: Pain less, pulse weak. Death.	Pancreas dirty-red, containing brownish-black nodules, mottled with opaque white spots. The microscope showed dilute blood, and amorphous clumps of the same. The white spots due to short, stellate, or spindle-shaped crystals in the fat tissue. Outline of glandular nuclei indistinct. Peritoneum reddened.
XXIII.....	Whitney: Boston Med. and Surg. Jour., 1881, cv. 592.	M.	Adult. Robust; occasionally easily relieved, painful indigestion. A year ago jaundice, lasting two and one-half months, accompanied with some epigastric pain.	Epigastric pain, unable to continue occupation. 2d day: Symptoms of peritonitis with great prostration. Death on the following day.	Pancreas enlarged, soft, pale, dirty-yellow, streaked with numerous opaque-white streaks and spots, also dark-brown and reddish-black spots. Head of pancreas infiltrated with blood-clots. Head of pancreas surrounded with clotted blood. Numerous hemorrhagic patches in the mesentery. Also opaque, bright-yellow patches, up to the size of a cherry-stone in the subperitoneal fat of the abdominal walls, and in that of the omentum and mesentery.
XXIV.....	Balser: Virchow's Arch., 1882, xv. 525.	M.	Enormous quantity of subcutaneous fat.	Sick for 2 or 3 days before death with slight, gastric difficulties. Soon followed by vomiting, symptoms of peritonitis and collapse. Diagnosis, internal strangulation.	

Seventeen Cases of Hemorrhagic Pancreatitis—Continued.

No.	Authority.	Sex.	Age	Antecedents.	Symptoms.	Lesions.
XXV.	Haidlen : Chl. f. Gyn., 1884, viii, 609.	F.	33	During first pregnancy much gastric disturbance, and headache. In the last three months violent attacks of abdominal pain, suggesting impending perforation. Slow recovery. Two attacks during the five weeks after delivery.	Sudden, violent pain near pylorus, 37 days after delivery. Occasional vomit, some collapse, no fever. Sensitive epigastrium, abdomen moderately distended. The violent, epigastric pain persisted, meteorism took place. Collapse and death in 5 days.	Pancreas enlarged, almost wholly transformed into a brownish-red, bloody mass. The microscope showed a small-celled infiltration and hemorrhage which may have continued for some days. Duct somewhat dilated. Adjacent omentum slightly suffused with blood.
XXVI.	Eichhorst; Eulenburg's Real-Encyclopädie, 1885, ii, 434.	....	....	The patient died of ileus,	There was a hemorrhagic pancreatitis and peripancreatitis. The pancreas was as large round as a man's arm, and was so wedged between the spleen and the duodenum as to completely obstruct the latter. Pancreas enlarged, hard. Between it and the duodenum, encroaching on the former, but adherent to both, was a flattened mass of blood an inch and a half in diameter.	
XXVII.	Ansdon : Boston Med. and Surg. Jour., 1886, cxv, 594.	M.	Adult.	In perfect health.	Sudden nausea, vomiting, and slight diarrhoea. Some hours later severe gastric and abdominal pains and cramps. 2d day : Pains more frequent, intense thirst; collapse. Slight albuminuria. 3d day : No defecation. Subnormal temperature. Unexpected death on the fourth day.	
XXVIII.	Pinkham and Whitney : M.S. Notes, 1886.	M.	40	For a year or more general malaise and lack of strength, attributed to indigestion.	Hepatic pain, vomiting, weak heart. Death on the sixth day, preceded by cessation of the pain and vomiting.	Pancreas very large, on section, dark-red, streaks, and patches between the lobules. The fat tissue of the abdomen, especially near the pancreas studded with opaque, white spots of fat necrosis, with a well-defined, blackish edge. Colonies of micrococci found near these spots.

XI.	Osler and Hughes : Trans. Phila. Path. Soc., 1887, xiii. 24.	M. 58	.....	Intense epigastric pain for several days. Universal, interstitial, pancreatic hemorrhages, with clots in the tail. In the body of the gland the acini appeared as grayish-white areas surrounded by the dark red hemorrhagic exudation. Increased round-cells in the semi-lunar ganglia, whose ganglion-cells were cloudy and indistinct. Oedematous Pacinian corpuscles behind duodenum and pancreas.
XXX.	Hirschfeld : Berl. Klin. Woch., 1887, xxxiv. 287.	F. 56	Very fat...	Attacked with vomiting, abdominal pain; complete obstruction. A swollen, intestinal convolution to be felt in the right side. On the 4th day, sudden collapse, mind clear, abdomen distended, very painful, no palpable tumor. Laparotomy. Death 5 hours later.
XXXI.	Birch and Hirschfeld : Lehr. d. Path. Anat. 3te Aufl., 1887, ii. 639.	M. 38	.....	Sudden, violent, colicky pains above the navel. Soon, high fever, delirium, copious green vomit, and death on the 2d day.
XXXII.	Op. cit.	M. 42	.....	Pancreas doubled in size. On section, dark-red, mottled with opaque, white spots. Fat-tissue near pancreas, and in root of mesenteric artery discolored red. Mesenteric fat-tissue showed numerous opaque, white spots. The fat-tissue in places discolored; soft, and foul-smelling. Thrombosis of splenic, pancreatic, and mesenteric veins. No infiltration about semi-lunar ganglion.
XXXIII.	Putnam and Whitney : MS. Notes, 1888.	M. 48	.....	Awoke with severe gastralgia, vomiting, later collapsed, 2d day; Restless, but comfortable with morphia. Haemorrhage, vomiting some dark, red lumps. 3d day: Rapid breathing, cyanotic, collapse. Death.

There is an extensive inter- and intra-lobular infiltration of fat-tissue. The inter-lobular fibrous tissue is increased in places, and the contained duct is widely dilated. The pancreatic lobules are, at times, diffusely stained of a brownish-yellow color. Certain lobules contain clusters of orange-colored, acicular crystals, especially in the vicinity of the fat-tissue. The inter-lobular fat-tissue shows circumscribed, as well as diffused, hemorrhagic infiltration. There is, in addition, an excessive accumulation of round cells, in places wholly cellular, again fibrino-cellular, entirely replacing the fat-tissue. There are sharply defined islets of fat-tissue in which the individual cells are indistinct, without nuclear staining, the whole filled with acicular fat-crystals. The border is often sharply defined by a zone, in which are small, round clumps of orange-colored, acicular crystals, and outside of which a line of round-celled accumulation is frequent. Bacterial clumps and venous thrombi are present.

The described changes in the inter-lobular fat-tissue are likewise seen in the parapancreatic fat. The following is the history of Case XXXIII., for the notes of which I am indebted to Drs. J. J. Putnam and Whitney. The patient was a gentleman, forty-eight years of age, who had been hemiplegic for several years. He was well-nourished but not excessively fat. He had suffered from several attacks of pain in the region of the stomach, with chilly sensations, from which he recovered in the course of twenty-four hours. They were usually attributed to indigestion, but no exciting cause was ever discovered. He had one severe attack of this sort a year before his death, and became collapsed, and was covered with cold sweat. His mind was dulled and his talk somewhat incoherent. He rallied under the use of stimulants, and in the course of a day or two appeared in his usual health.

At 5 A.M. he was seized with a severe stomachache, and a few hours later vomited, with temporary relief to the pain. Throughout there was considerable dull epigastric pain, and occasional nausea and vomiting. In the evening, immediately after vomiting, he suddenly became collapsed. There was constant pain throughout the night, and restlessness. During the second day he improved somewhat, although annoyed by hiccough. He vomited chiefly mucus, in which were found several small dark-red lumps about the size of peas.

Early in the third day he was very restless, cold, and livid, his breathing rapid, and his pulse almost imperceptible. He was conscious but anxious, and died within six hours after the collapse became extreme.

The pancreas was about twice the normal size ; on section, of a dark-red color mottled with opaque-white spots

and patches, which lay between the lobules of the gland. These changes were most marked in the body of the gland, the head being relatively normal. The fat-tissue near the pancreas, that in the root of the mesentery, and in the meso-colon near the spleen, was of a dark-red color. In places it was soft, discolored, and foul-smelling. Numerous opaque, grayish-white spots were visible beneath the mesenteric peritoneum. The splenic vein contained a soft, dark, adherent thrombus which was continued into some of the pancreatic veins. Recent thrombi were also found in some of the mesenteric veins. The spleen was slightly enlarged, the pulp increased and dark red.

There was no infiltration in the vicinity of the solar plexus and semilunar ganglion.

There was no evidence of a peritonitis.

In the microscopic examination of the hardened pancreas there is seen a sharp differentiation of the section into three zones.

The intermediary zone represents the inter-lobular fat-tissue which is continuous with that around the pancreas. It is not only extensively infiltrated with blood, but is often transformed into a porous structure from the apparent destruction of fat-cells. Elsewhere it contains a fibrillated meshwork, finely granular material, bacteria, and numbers of acicular fat-crystals. There is also an occasional round-celled infiltration of this fat-tissue between the relatively normal portions of the pancreas and the hemorrhagic and necrotic inter-lobular fat-tissue.

On the one side of this intermediary zone the acini are distinctly defined and the nuclei clearly stained. Occasional lobules are seen with granular epithelium and indistinct nuclei. There are, in places, an intra- and inter-lobular infiltration of blood-corpuscles and numerous accumulations of round cells. The inter-lobular tissue shows a fibrillated meshwork, apparently clotted fibrine; in the smaller ducts are numerous leucocytes.

On the other side of the hemorrhagic zone, although the lobules are distinct, the borders of the acini are often confused. The cells are granular, frequently not differentiated, and there is no staining of the nuclei. At times the lobules are replaced by a granular detritus, or the cells are widely separated from each other. Here and there among these necrotic acini are stained islets, apparently bacterial colonies, thrombotic veins, and, more rarely, small accumulations of round cells. At the edge of the pancreas is a large venous thrombus containing innumerable bacteria.

Of the seventeen cases of hemorrhagic pancreatitis fourteen were males and two were females, the sex of one person not being stated. Their ages were as follows:—

Years of age.	Number of cases.
From 25-30.....	1
" 30-35.....	2
" 35-40.....	1
" 40-45.....	4
" 45-50.....	1
" 50-55.....	1
" 55-60.....	2

One was described as a young adult, two as adults, and nothing was stated concerning the age of two.

The patients were usually in good health at the time of the attack, a few of them being conspicuously strong and robust. Nearly one-half of them were abundantly or superabundantly provided with fat-tissue.

A small fraction, nearly one-sixth, was addicted to the abuse of alcohol. Nearly one-half of the cases suffered from previous attacks of indigestion. These attacks were usually characterized by pain which was colicky, gastric, or abdominal, and so severe in one instance as to suggest impending perforation. Vomiting, either watery or bilious, or both, was noted. Nausea, belching, and diarrhoea were recorded. Jaundice occurred in a single instance.

It is obvious from the above statement that the previous digestive disturbances were rather gastric, or gastro-duodenal, than enteric. The immediate attack began, in the great majority of cases, with abdominal pain, usually without known cause, though rarely some irregularity in diet appears to have been an immediate predecessor. The pain was violent, intense, or severe, either constant or paroxysmal. Its seat was usually in the upper abdomen, and, in one instance, was stated to have followed the course of the pancreas; subsequently, in one-fifth of the cases, the abdominal pain became general. The initial pain was usually followed by vomiting, more rarely by nausea alone. In one case there was a conspicuous record of no vomiting. The vomiting was constant, repeated, or occasional. It might be copious. It was bilious at times, or black, and contained, in one instance, dark-red clumps the size of peas.

Constipation was a symptom of frequent occurrence, and a diagnosis of intestinal obstruction was made in three instances, in one of which laparotomy was performed. The occurrence of diarrhoea was noted in but one case. Hiccough and albuminuria each were reported in a single case.

Fever was an inconstant symptom. When present it was of early occurrence, and might be high on the second day. On the contrary, the temperature might be normal on the first day and subnormal on the following day. Delirium was present in three cases.

A tympanitic swelling of the abdomen was of no infrequent occurrence. It was usually general, or in the upper

abdomen, and was generally localized in the lower abdomen. In one case, thought to be of intestinal obstruction, a swollen intestinal convolution was to be felt in the right side.

Symptoms of collapse were almost invariably present, and usually directly preceded death.

This occurred as follows :

On the 2d day in.....	3 cases.
" 3d "	5 "
" 4th "	3 "
" 5th "	2 "
" 6th "	1 "

It took place after a few or several days, each in one case. The diagnosis lay between intestinal obstruction, perforative peritonitis, and an irritant poison. The pancreas was found enlarged, either throughout or at one extremity, usually at the head. The gland was frequently doubled in size, and might seem still larger when abundant fat-tissue was present. The enlargement has been compared to the size of a man's arm. The gland was generally dense, sometimes friable, and has been noticed to be of diminished consistency. The existence of hemorrhage was usually suspected by the appearance of the surface, which is of various shades of red. On section, however, the color may be dark-red, reddish-brown, violet, reddish-black, or even black. The modification in color may be uniformly distributed, or lie in patches, or in specks. The patches correspond with nodules which may project above the surface. These discolored patches may show white specks or streaks, and the red color may lie in the inter-lobular tissue of the pancreas.

The color of the section may be affected by the presence of associated alterations, one of which is accidental, the other may be incidental. The former is due to an excessive quantity of fat-tissue in the pancreas, sometimes appearing to form nodules as large as hazel-nuts, and to treble the size of the gland. Bands and spots of a translucent yellow are thus produced which are mottled with shades of red. The incidental appearance is due to the presence of opaque-white specks, spots, and streaks, which are generally known, since the publication of Balser's⁵⁷ article, by the term fat-necrosis. These were seen in six of the cases, and it is not improbable that the granular exudation described by Löschner may have been of the same nature.

The pancreatic duct may contain a bloody, ichorous fluid, and its branches may be plugged with clotted blood. The duodenum and jejunum may show swelling, injection,

and ecchymosis. The hemorrhagic infiltration may be found beyond the pancreas, both in the parapancreatic tissue, mesentery, meso-colon, and in the omentum. It may extend downward behind the descending colon, nearly to Poupart's ligament, and may be found at the outer border of the left kidney. The splenic artery and vein are usually free from changes. The latter may contain a thrombus. The portal vein has been found free from thrombosis. The condition of the other organs is essentially negative. The heart may contain liquid blood, or a differentiated clot may be found in the right ventricle. The spleen may be small, with wrinkled capsule, or it may be slightly enlarged and injected.

The peritoneum usually shows no alterations, although evidence of recent peritonitis may, at times, be found.

The microscopical changes to be found in the diseased pancreas have been sufficiently detailed in the reports of Cases XXVIII. and XXXIII. They consist essentially in the evidence of an extensive hemorrhagic infiltration limited more particularly to the interlobular tissue. Also in the presence of cellular and fibrino-cellular formations in the same tissue. Smaller accumulations of round cells and hemorrhages may be found within the lobules, and the ducts may be filled with indifferent cells. The appearances characteristic of a coagulation-necrosis, also thrombosis of the smaller veins, are to be found in many lobules as early as the third day, as are all the other changes above described. The spongy condition of the hemorrhagic region and the numbers of associated bacteria are indicative of putrefactive changes. Whether these are of ante- or post-mortem origin, the evidence at hand does not decide. Finally, the discovery by Osler and Hughes⁶⁸ may be mentioned, where an increased number of leucocytes was found in the semilunar ganglia, and an indistinctness and cloudiness of the ganglion-cells.

In summing up the clinical and anatomical characteristics of these cases we have the following brief description of an affection which wholly justifies the term acute hemorrhagic pancreatitis.

It is a disease which may take place without any well-defined cause, but is most likely to occur in persons who have had previous attacks of gastric or gastro-duodenal dyspepsia.

It begins with intense pain, especially in the upper abdomen, soon followed by vomiting, which is likely to be more or less obstinate, and not infrequently by slight epigastric swelling and tenderness, with obstinate constipation.

A normal or subnormal temperature may be present, and

symptoms of collapse precede by a few hours death, which is most likely to occur between the second and fourth days.

The gross lesions are due to hemorrhage in and about the pancreas, and the microscope shows cellular and fibrino-cellular exudations in its interstitial tissue, and necrosis of its lobules.

PART II.

SUPPURATIVE PANCREATITIS.—In order to more fully appreciate the relation which hemorrhagic pancreatitis may bear to pancreatic inflammation and hemorrhage, it becomes necessary to consider the evidence in favor of other varieties of acute pancreatitis. Although the authorities of the present day make but little mention of a suppurative inflammation, Lieutaud,⁵⁹ in the last century, alludes to cases of pancreatic abscess reported by Bartholinus, Tulpius, Aubert, and Patin.

To these may be added those of Riolanus, Bonz, and Gautier, referred to by Ancelet.⁶⁰ Clässen⁶¹ states that Blancard, in 1688, described the occurrence of small, purulent points on the surface of the pancreas of a child who died of small-pox. Also that Tonnellé found a suppurating pancreas in two cases of puerperal fever. But the cases thus referred to are almost invariably of but little value for purposes of comparison. Döring,⁶² for instance, found the enlarged and indurated pancreas connected with an abscess in the mesentery of the transverse colon, which held some four ounces of offensive yellow pus, apparently proceeding from the pancreas. But the evidence is wanting to show that the pancreas was the source of the disease.

Portal⁶³ saw the pancreas soaked in pus in the body of a man who died after a violent attack (of gout?). Again,⁶⁴ he found the contents of the abscess often enclosed, as in a pocket, in a membranous sac formed by the cellular tissue which covers the pancreas. He declares that he has seen more than a quart (*deux livres*) thus enclosed. Here, again, the question may be raised as to the nature of the abscess and its relation to the pancreas. His mention⁶⁵ of the man who died after extirpation of the testicle and ligature of the spermatic cord, is worthy of note. A large quantity of pus was found in the cord, and a considerable abscess around the pancreas.

⁵⁹ Op. cit., i., 244.

⁶⁰ Maladies du Pancreas, 1804, 19, 20.

⁶¹ Op. cit., 64.

⁶² Altenburger Jour., 1817; Clässen, op. cit., 264.

⁶³ Anat. Med., 1803, v., 352. ⁶⁴ Op. cit., 353. ⁶⁵ Op. cit., 353.

It is supplemented by the case reported by Moore,⁶⁶ of a young man who was seized with a sudden abdominal pain, which in the course of twenty-four hours became worse, and fixed in the right iliac fossa. There was vomiting, constipation, and chills. For several days the patient was not confined to his bed, but he died on the nineteenth day. The diagnosis was typhlitis. The perforated vermiform appendix led into an abscess which had penetrated the iliac muscle and communicated with the cæcum.

There were one large and several small abscesses in the pancreas. The two main veins were filled with thrombi; there was a portal thrombosis continued to the liver, and a parietal thrombosis of the vena cava.

There were numerous small abscesses in the brain.

The case reported by Percival,⁶⁷ as of pancreatic abscess, must be regarded as of somewhat doubtful nature. A man of middle age was sick for three months with jaundice, bilious vomit, and a hard epigastric tumor.

Blood, and finally, fetid pus were discharged from the bowels. Eventually anasarca occurred. The epigastric tumor proved to be the greatly enlarged pancreas, which was scirrhouss, and contained a considerable abscess.

The common duct was impervious from the pancreatic pressure, and the liver was "much diseased."

Andral⁶⁸ found two small abscesses in the middle of the pancreas.

In order to determine the relative frequency of suppurative pancreatitis, the conditions of its occurrence, its symptomatology and results, the cases in the following table have been collected.

They are twenty-two in number. One was of recent occurrence in Boston, for the notes of which I am indebted to Drs. Sears, Thompson, Jones, and Whitney.

The more detailed history of Case LV. is as follows: The patient was thirty-nine years of age, rather fat, intemperate. For a year or two before her fatal illness she had suffered more or less from poor appetite, distress after eating, wind in the stomach, and costiveness.

She was seized with sudden epigastric pain, without known cause, followed by vomiting, and the bowels were constipated. On the following day the pain became worse, but was somewhat relieved after vomiting. The next day, after a dinner of roast goose and cabbage, the pain became much aggravated. It was intense on the fourth day, and there was constant hiccup and vomit-

⁶⁶ Trans. Lond. Path. Soc., 1882, xxxiii., 186.

⁶⁷ Trans. Asso. K. and Q. Coll. Phy., Ireland, 1818, ii., 132.

⁶⁸ Précis d'Anat. Path., 1829, ii., 582.

ing. The epigastrium was sensitive, and the abdomen swollen. Pulse, 120; temperature, 103.4° F. She remained in this condition for several days, without any movement of the bowels, and intestinal obstruction was suspected. Castor-oil finally produced a dejection which was followed by a lowering of the pulse and temperature.

For nearly a fortnight she was not seen by a physician, and she was then admitted to St. Monica's Home, where she remained two weeks. During her stay she was dull and stupid, suffered from moderate epigastric pain and sensitiveness, nausea and vomiting, and inability to eat solid food. The skin was not hot to the touch. Pulse, 80. Her bowels were kept open by laxatives or enemata. There was a trace of albumin in the urine. The abdomen was full and rounded, and nothing abnormal was discovered on palpation. During the latter part of her stay she was able to sit up, daily, for a short time. She left the Home without the knowledge of the physician, walked some distance, and was supposed to have drunk to excess.

Three days later she was seen by Dr. Sears, who found her suffering from severe pain in the right hypochondrium and epigastrium, with marked prostration. Her thirst was intense, but she immediately vomited everything swallowed. There was constant expectoration of thick, frothy mucus. Pulse, 120; temperature, 99.4° F. The abdomen was distended, the walls rigid. There was especial prominence of the epigastrium and right hypochondrium. This condition persisted during the three following days, at the end of which she was taken to the Massachusetts General Hospital, where she died in the course of a few hours, at the end of the seventh week of her illness.

Dr. Whitney, who made the post-mortem examination, found the pancreas of normal size and density, in general of an opaque-gray color.

At the lower part of the head was a trabeculated cavity with dirty-green, shreddy walls, and containing cheesy, necrotic material. A large branch of the duct, with a ragged edge, opened directly into this cavity. Its wall, near the cavity, was green and soft. The main duct was intact, but contained, near its outlet, a small quantity of dirty-brown, viscid fluid. The parapancreatic fat-tissue formed a part of the wall of the cavity above mentioned; near the splenic end of the pancreas was a hole in the fat-tissue, as large as a walnut and containing a dirty-green fluid. Elsewhere in the neighboring fat-tissue, and in that of the mesentery, meso-colon, and posterior abdominal wall, were numerous opaque-white, pap-like nodules

Twenty-two Cases of Suppurative Pancreatitis.

No.	Authority.	Sex.	Age.	Antecedents	Symptoms.	Lesions.
XXXIV . . .	Bailie : Morbid Anat., 1833, 221, 223.	M.	20	.....	General abdominal pain, nausea, sense of distension and weight in stomach after eating. Tendency to purge. Drowsy.	Pancreas a good deal enlarged and contained a considerable quantity of pus.
XXXV . . .	Perle. De pancreate eiusque morbis. Diss. Instig. Berl., 1837, 33.	M.	Adult.	Feeble, scrofulous, phlegmatic.	Dull epigastric pain for several weeks, then becoming violent, with nausea; offensive, loose stools; quick pulse, dry skin, sensitive epigastrium. Temporary improvement. Return of diarrhoea, fever, emaciation, weakness. Death at end of more than four months.	Pancreas in part hardened, in part full of pus. The pus had escaped into the abdomen. Other organs normal.
XXXVI . . .	Fletcher: Prov. Med. and Surg. Jour., Lond., 1848, 20.	Med.	Adult.	Corpulent, apparently much addicted to food and drink.	Great epigastric pain, distension after meals, continued dull pain, extending into both hypochondria above navel, relieved by purgatives, vomiting, constipation. Stools finally feid, bloody. Temporary improvement, hectic, and death after nine months of illness, and four months in house. Intestinal obstruction suspected.	Enlarged pancreas formed a purulent mass without healthy structure. Its extremity had ulcerated into the duodenum at lower curvature, through which pus must have passed into the intestine. Liver enlarged, spleen normal.
XXXVII . . .	Kilgour: Lond. Journal of Medicine, 1850, ii, 1052.	M.	41	Indolent, large eater, fond of sweets. For some years attacks of bilious dyspepsia. Last attack seven months ago, did not recover as usual.	Emaciated, feeble, dispirited, restless; frequent vomiting, eventually of thinropy mucus. Sensation of distended stomach and bowels, in which much gas. No appetite, no thirst, sluggish bowels, consistent stools, unmixed with bile and very feid. No pain nor sensitiveness, nor tumor. Left abdomen dull, tympanity in right abdomen and over stomach.	Pancreas much enlarged, envelopes thickened. Entire gland formed a trabeculated cavity filled with creamy pus and a few cheesy masses about the size of a bean. The duodenum contiguous to the pancreas broke into pulpaceous shreds, even on cautious handling. Spleen enlarged one-third. Despite extreme emaciation a half inch of fat in the abdominal wall.

Twenty-two Cases of Suppurative Pancreatitis—Continued.

No.	Authority.	Sex.	Age.	Antecedents.	Symptoms.	Lesions.
XLI.	Roddick : Canad. Med. Jour., 1869, v. 385.	M.	30	Intemperate. Much exposed when drunk, and then has diarrhoea. Has had two attacks of intermittent fever. Chronic cough for two years. Under treatment for syphilis. Catarrhal symptoms and great debility for two weeks.	After two days of constipation slight epigastric pain and vomiting, thirst, hot skin, no appetite. The bowels were moved freely. A chill occurred, followed by fever, chills, and diarrhoea toward the end of the week, then slight jaundice, persistent chills, and diarrhoea, and death in a collapse on the twelfth day.	Pancreas firmly adherent. On section of the enlarged head an abscess opened, the walls thick; contains, an ounce of pus. The dilated duct in the head held several calculi. Spleen weighed 11½ ounces. Lungs pathetical, and containing a central, chocolate-colored nodule from which pus escaped.
XLI.II.	Nathan : Med. T. and Gaz., 1870, ii. 238.	M.	25		For two days gastric irritability, nausea, constipation; then incessant hiccup. Epigastrium distended, tympanitic, no pain, no tenderness, constant copious vomiting of thin, brownish, stringy fluid; no jaundice; increasing loss of flesh and strength. Death from exhaustion in six days from the onset of the symptoms of gastric disturbance. Diagnosis, ileus.	Pancreas large, head indurated, mortar-like, coats thickened. Small omental hemorrhages. Distended gall-bladder.
XLI.III.	Smith : Dublin Jour. Med. Sci., 1870, 201.	M.	....		....	Pancreas closely connected with neighboring organs. Splenic end contained a small abscess, with thick greenish-yellow pus. Several small lymphatic glands near duodenal end contained similar pns. Abscess in the diaphragm above the spleen.
XLI.V.	Frison : Marceille Med., 1875, xii. 257.	M.	30		....	Abscess of pancreas surrounded with adhesions. Continued fever, severe abdominal pain at level of spleen, which was supposed to contain an abscess. Death in a month.

XI.V.....	Frison : Loc. cit.	M.	28	Delicate ; suffered from loss of appetite, epigastric pain, jaundice, hard work and extra hours.	Pancreas enlarged threefold, indurated, infiltrated with pus. A large collection of thick, yellow pus in the tail. Numerous small abscesses in the left lobe of the liver. Enormous dilatation of the common bile-duct. Spleen not enlarged.
XLVI.....	Friedreich; Ziemsen's Handb. d. Sp. Path. u. Ther., 1875, vii, 2, 243.	M.	40	.....	Pancreas enlarged threefold, reddened, consistency increased, studded with hundreds of abscesses up to the size of beans, many projecting had burst into abdomen. General fibrino-purulent peritonitis, especially in the upper abdomen.
XI.VII.....	St. George's Hosp. Rep., 1877-78, 1879, ix, 95.	M.	...	Strong ; temperate. Disease like for fatty food. Sick-headaches, left inguinal hernia.	Head of pancreas enlarged. A diffused abscess followed the course of the ducts and opened into the lesser omental cavity which was full of pus, and communicated with the duodenum. Thrombosis of femoral vein. Cheesy apices, liver cirrhotic, distended bile-ducts.
XLVIII.....	Shea : Lancet, 1881, ii, 791.	F.	29	Fifteen months ago pain in region of liver, increasing and shooting ; no nausea, poor appetite, bowels regular, faeces dark.	The enlarged and hard pancreas contained an abscess. A round worm, seven inches long, lay partly in the duodenum, partly in duct gall-bladder, nausea, bilious vomit jaundice ; rapid breathing, unconscious. Death in thirty-six hours.

Twenty-Two Cases of Suppurative Pancreatitis—Continued.

No.	Authority.	Sex.	Age.	Antecedents.	Symptoms.	Lesions.
XLIX . . .	Fraenkel: <i>Ztschr. f. klin. Med.</i> , 1882, iv, 277.	M.	58	A year ago loud belching; after an error in diet, vomiting and severe abdominal pain, no abdominal fulness, no sensitiveness. Nine months ago pale, sensitive epigastrum; black, tarry stools. Recovered from these symptoms, but was pale and emaciated. After five months another attack of intense gastric disturbance, lasting a fortnight. Then improvement, and gain in weight.	After four days increasing meteorism, fever, return of vomit, sleeplessness, progressive weakness, collapse, and death on the eleventh day.	Pancreas, swollen, anterior surface dotted with numerous yellowish-white prominences, up to the size of hemp-seed, alone and in groups, forming cavities with smooth walls and fat-like contents. A group of these gray, gangrenous, covered with shreedy, peritoneum. The contents of these cavities were partly granular, corpuscles and detritus. The smallest had a wall of small-celled infiltration, similar facets on section, also narrow and broad bands and diffused growth of fat-tissue. Similar prominences in the transverse mesocolon and mesentery, in the former a circumscribed necrosis with floating shreds, and fresh peritoneal adhesions. Abundant subperitoneal fat.
L.	Moore: <i>Trans. Lond. Path. Soc.</i> , 1882, xxiii, 186.	M.	25	.....	Obscure symptoms of peritonitis.	Pancreas extensively destroyed by suppuration. The remaining splenic end infiltrated with pus, showed a ragged surface, forming part of the wall of an abscess, bounded below by the lowest four inches of the ileum, and above by the stomach, spleen, abdominal wall, and coils of intestine. Head of the pancreas partly broken down, found one wall of an abscess elsewhere, bounded by peritoneal adhesions.
LI.	Moore: Loc. cit.	M.	74	.....	.....	A large part of the head of the pancreas destroyed by an abscess bounded by pancreas, duodenum, and under-surface of stomach. The dilated common duct communicated with the abscess, and the latter opened into the peritoneal cavity and invaded the pancreatic and duodenal artery.
LII.	Moore: Loc. cit.	M.	35	.....	Slight jaundice.	

I.III.....	Musser; Am. Jour. Med. Sci., 1886, N.S., vcl. 49.	M.	42	Intemperate; exposed to hardness.	In the head of the pancreas an abscess as large as an orange. The rest of the gland dense, containing numerous pus pockets. Ducts dilated. The large abscess opened into a pus cavity, bounded by posterior wall of stomach, pancreas, duodenum, transverse colon, and peritoneum. Portal vein filled with a puriform thrombus extending into hepatic, splenic, and mesenteric veins. Slight cirrhosis; small soft spleen. Recent peritonitis; bronzed skin.
L.IV....	Bamberger; Wiener Clin. Woch., 1888, xxxii.; Allg. Med. Centr. Zeit., 1888, lvii, 1870, 1886.	M.	20	.....	Ate a probably putrid sausage. Sudden Headache. Violent vomiting, prostration, nausea, alternating heat and cold, severe headache. The next day chill, cutting pains in abdomen, diarrhea. On the fifth day high fever, meteorism, dilated gastric and ileo-caecal regions. A week later jaundice. After five days the liver became enlarged, painful, and sensitive; the abdomen eventually distended and tense; the stools thin and pap-like; urine frequently contained peptones; one or two daily chills with atypical and abrupt changes of temperature. Eventually repeated watery vomit; hiccough. Death in collapse at the end of the sixth week.
L.V.....	Mass. Gen. Hospital Records, and M.S. Notes, 1888, v. 33.	F.	39	Intemperate. Has suffered for a year or two from poor appetite, distress after eating, pain in stomach; constipation.	Sudden epigastric pain, vomiting, constipation. In the course of a few days after an error in diet the pain became intense, accompanied with fever. There was constant hiccough and vomiting. The abdomen became swollen, and the epigastric sensitive. The constipation persisted, and intestinal obstruction was suspected. Six days before death, after indulging in alcohol, the symptoms became aggravated, and death occurred on the forty-eighth day.
					The head of the pancreas contained a trabeculated cavity with green, shaggy walls which communicated with the parapancreatic fat tissue, a branch of the duct with green and friable walls opened into the cavity. In the fat tissue at the splenic end of the pancreas was a cavity containing a dirty green fluid. Multiple nodules of fat necrosis are present, also peritoneal adhesions between stomach and transverse colon in the omental bursa. No general peritonitis. Nothing abnormal in the portal vein or its branches.

from the size of a pin-head to that of a pea. They were, at times, aggregated in clumps; the contents could be squeezed out. The smallest nodules were frequently surrounded by an injected border.

There was nothing abnormal in the portal vein or its immediate radicles. The liver was in a condition of brown atrophy, and there were minute, pale-yellow calculi in the gall-bladder and common duct. There was no evidence of a general peritonitis, but on cutting through the meso-colon the stomach and colon were found slightly adherent. The microscopic examination of the fat-tissue showed characteristic necrotic patches with a margin of round-celled infiltration. Also occasional small abscesses and more diffused infiltrations of leucocytes.

In addition, occasional circumscribed, round spots were seen, composed of more or less elongated and fat-cells, enclosed within a fibrous border. The cells varied in size, some being considerably larger than fat-cells and containing several nuclei, while the smallest had a diameter four times that of a red blood-corpuscle. These patches suggested a lymph-vessel plugged with desquamated and oedematous endothelium.

Dr. H. Jackson, under the supervision of Dr. Ernst, made a bacteriological analysis of the necrotic fat-tissue from the above case. From Dr. Ernst's report it appears that four varieties of bacteria were isolated:

1. A liquefying, fluorescent organism, which proved to be a fine, short rod, half the size of the bacillus of tuberculosis.
2. An organism closely resembling the staphylococcus pyogenes citreus, both in the manner of its growth and in its microscopical appearances.
3. Very short, rather thin, non-liquefying rods, which formed thin, grayish, almost translucent, and much-wrinkled pellicles on the surface of the gelatine and agar-agar, around the mouth of the needle-track.
4. The only organism found in large numbers. The cultures grew as finely beaded colonies along the needle-track, with a flat, pearl-gray top extending two or three millimetres over the surface of the nutrient material. Microscopic examination showed the organism to be composed of very short, thick rods, resembling somewhat the appearances found in one or two of the sections of the necrotic tissue. It did not liquefy the gelatine.

Of twenty-one patients, seventeen were males and four were females; all were adults, whenever ages were mentioned, and in eighteen cases the age was given as follows:

Years of age.	Number of cases.
From 20-25.....	3
" 25-30.....	4
" 30-35.....	2
" 35-40.....	2
" 40-45.....	3
" 45-50.....	0
" 50-55.....	1
" 55-60.....	1
" 60-65.....	1
" 65-74.....	1

Previous attacks of indigestion, of greater or less frequency and severity, were present in about one-fourth of the cases. These attacks were usually regarded as gastric or bilious. One patient suffered from sick headache, while another was subject to diarrhoea during his drinking-bouts. Three were distinctly intemperate, two might be regarded as gluttonous, and one was exposed to hard work and extra hours.

The immediate attack was precipitated in two instances by errors in diet, in the one case a probably putrid sausage having been eaten. The attack was greatly aggravated in a third case by a dinner of roast goose and cabbage. Two weeks of catarrhal symptoms with great debility were the antecedents of another case.

A striking feature in the history of these cases of suppurative pancreatitis is the tendency of this affection to become chronic. Of fourteen cases six were fatal in the first month, three during the second month, and five at various periods between four and eleven months. Death might take place at the end of the first week, and even the more chronic cases often began with distinctly acute symptoms.

It is therefore desirable, in the consideration of this series of cases, to group them with particular reference to the rapidity of their course.

The cases of acute suppurative pancreatitis usually began suddenly, with severe, generally intense, gastric, epigastric, or abdominal pain, vomiting, and sometimes great prostration. The vomiting might be incessant and distressing, or it might give temporary relief to the pain. The ejected fluid was sometimes stringy and brown. The bowels were usually constipated, although diarrhoea might occur within the first twenty four hours. This latter symptom was not infrequent at a later date of the disease.

Fever, usually slight, was the next conspicuous symptom, being manifested about the third day. At the same time the upper abdomen, especially the epigastrium, was likely to become distended, tympanitic, and sensitive. Hiccough, sometimes quite obstinate, was not infrequent at

this stage, and occasional chills were to be met with. The abdomen, in general, then became moderately swollen, tense, and tympanitic.

With the violent onset and persistence of these symptoms death might occur, perhaps, in the course of a week or more.⁶⁹ The pancreas then was markedly enlarged, reddened, and studded with hundreds of small abscesses, many of which had burst into the peritoneum. The associated fibrino-purulent peritonitis was most marked in the upper abdomen. In the second case,⁷⁰ where death resulted in eleven days, the attack was apparently recurrent in a corpulent person who had suffered for a year from symptoms which might be attributed to pancreatic disease. There were found in the pancreas numerous small, yellowish-white prominences, alone and in groups, with soft, pap-like contents. They were present on section as well as superficially. The contents were fatty-degenerated cells and detritus. The wall of the smallest cavities was infiltrated with round cells, while that of the others was smooth. A group of these prominences were grayish, discolored, gangrenous, the superficial peritoneum being perforated and shreddy. Similar nodules were found in the mesentery and in the transverse meso-colon. In the latter was a circumscribed necrosis with floating shreds and fresh, peritonitic adhesions. The pancreas was irregularly traversed by narrow and broad bands and by a diffused development of fat-tissue. Not only does the clinical history of this case suggest a recurrent and finally fatal attack, but the pancreatic lesions also point to a long-standing process. Fibrous bands, fatty-degenerated cells and smooth-walled cavities filled with detritus favor this view. The description of these nodules suggests that many of them were probably foci of fat-necrosis, with gangrenous sloughing of the subjacent peritoneum.

An acute, suppurative pancreatitis, however, very rarely terminates at this early date. The symptoms already described may persist for three or four weeks, with progressive emaciation and debility, and death occur from exhaustion. Under such circumstances the simple abscess has been found surrounded with adhesions.

In another series of cases, beginning equally violently, there may be frequent chills and irregular, atypical, often high, fever, the maximum temperature being 105.8°. Slight jaundice may be associated. The pains extend into the hypochondria, and may spread from this point downward.

The liver, perhaps the spleen, may be palpably enlarged—the symptoms are conspicuously those of blood-

⁶⁹ Case XLVI.

⁷⁰ Case XLIX.

poisoning, and the patient dies collapsed in the sixth or seventh week. An abscess as large as a hen's egg, filled with greenish-yellow pus, may then be found in the pancreas. Also a pylephlebitis, apparently the result of the pancreatic abscess and associated with multiple abscesses in the liver, and acute peritonitis.⁷¹ Death at the end of seven weeks may result from the extension of the pancreatic abscess to the parapancreatic fat-tissue, with the production of multiple nodules of fat-necrosis.⁷² In this case the symptoms of epigastric pain, vomiting, constipation, and swelling were interrupted by a period of several weeks of comparative comfort, to be followed by marked prostration, incessant vomiting, severe epigastric pain and fever.

Another event in the history of acute, suppurative pancreatitis is to be found in the course of the third or fourth week of the tense and swollen, painful and sensitive, upper abdomen which follows the pain, vomiting, constipation, and fever. A diarrhoea then becomes conspicuous, perhaps preceded by violent paroxysms of lancinating pain shooting laterally in the epigastrium, producing temporary collapse.

The loose stools may be thin, yellow, and feculent at the outset and then become profuse and watery. This symptom may then subside, with a lowering of the fever and a general improvement, to recur after a few weeks with fever and abdominal distention, progressive emaciation and increasing weakness, ending in death in the tenth week.

Several small abscesses have then been found in the enlarged and firm pancreas, with sclerosed peripancreatic tissue. Communicating sinuses unite these abscesses and open into the adherent stomach and duodenum. A splenic thrombo-phlebitis and a hepatic abscess may be associated, also a fibrinous peritonitis, especially marked in the upper abdomen.⁷³

The early symptoms may be less severe and the disease be announced by progressing weakness and emaciation. Loss of appetite, slight jaundice, perhaps diarrhoea, may occur. There may be neither fever nor pain, or there may be obscure symptoms of peritonitis. Finally, anasarca or ascites becomes apparent, and death occurs from exhaustion, perhaps at the end of five months. The pancreas may then contain a diffused abscess, following the course of the ducts and opening into the cavity of the lesser omentum, which was filled with pus, and in its turn emptying into the duodenum through a sinus in the mesentery, these conditions being associated with a fibrino-

⁷¹ Case LIV.

⁷² Case LV.

⁷³ Case XL.

serous peritonitis. The pancreatic abscess may extend, at an earlier date even, to the omental cavity, thus forming a great pus-cavity extending as low as the lowermost coils of the ileum, and walled in by adherent intestines and stomach. The greater part of the pancreas may be destroyed. The common duct may open abruptly into the abscess of the pancreas, and leave it at the hepatic end. There may be an associated thrombosis of the portal vein continued into its primary sources, and the pancreatico-duodenal artery may be eroded, with hemorrhage into the cavity of the abscess. A recent peritonitis may be associated, and in one of these somewhat protracted cases, with extension to the omental cavity, a bronzed skin was present.

Finally, there are the most chronic cases, which extended over a period of nearly a year. As a rule no severe pain occurs at the onset, but the patient gradually becomes weak and thin; vomiting may be frequent, and a sense of distention of the stomach after meals or of epigastric pain be complained of. There may be little or no fever, or periods when chills and fever occur. The stools may be consistent, not colored with bile, and very fetid, or later they may be very offensive and mixed with blood. There may be a free communication between the pancreatic abscess and the duodenum, or the latter may break into pultaceous shreds when handled. The entire pancreas may be converted into a trabeculated cavity filled with creamy pus and cheesy masses, or it may be indurated and infiltrated with pus. In one of these protracted cases⁷⁴ diabetes appeared after the third month.

Noteworthy in these cases of suppurative pancreatitis is the rarity with which a circumscribed tumor is to be found. A swollen, tympanitic epigastrium is the rule, and very rarely a circumscribed resistant spot was to be felt above the navel, to the left of the median line.

Jaundice occurred in less than one-fourth of the cases. It was then usually slight. Its intensity in one case was connected with abscesses in the liver and dilated bile-ducts.

Another fact of considerable importance is the, usually, small size of the spleen. The rule was that no enlargement was noticeable even in those cases in which the thrombotic obstruction of the splenic or portal vein was recorded. The small spleen was usually of normal density.

From the above consideration it is evident that there are cases, few in number, of acute suppurative pancreatitis which run a course similar to that described in connection with hemorrhagic inflammation. They may

⁷⁴ Case XLV.

begin with equal suddenness, present the same grouping of symptoms, but are not so early fatal. They are more rarely associated with evidences of fat-necrosis, which were present in but two instances.

Although Klebs⁷⁶ regarded pancreatic abscesses, not arising from a peripancreatitis or from suppurating cysts, as of doubtful existence, it is apparent that this view is opposed by the evidence here recorded. It is also evident that the extension of an abscess from the neighboring lymph-glands to the pancreas is of extreme rarity. The only evidence in favor of this view is that offered by Portal⁷⁷ and in the case⁷⁷ reported by Smith. The possibility that a pancreatic abscess may be due to inflammation of the appendix is evident from Moore's case, although the connection between the two may have been through a mesenteric thrombo-phlebitis, arterial embolism, or through the coexistence of acute pancreatitis and appendicular inflammation.

The possibility that a pancreatic inflammation may be excited by the passage of a lumbricus into the pancreatic duct is admitted in connection with the appearances in Case XLVIII. It is still more probable, however, that the worm entered the pancreas after the establishment of the inflammation. Its presence there might be merely accidental, even taking place after death, as is likely to have been the fact in Case XL.

GANGRENOUS PANCREATITIS.—But the subject of acute pancreatitis deserves attention from another event, viz., its possible termination in gangrene.

The earlier medical writings contain occasional references to gangrene of the pancreas, but the evidence presented is so slightly objective as to make them of but little value for present needs.

Griselli⁷⁸ for instance, has been generally considered to have first called attention to this matter.

His patient, a man forty-two years of age, suffered from frequent colic, which was easily relieved. He was suddenly, without cause, seized with a chill and severe colic, and died quietly in the course of eighteen or nineteen hours. The post-mortem examination showed an extreme quantity of abdominal fat. The pancreas was found sphacelated, in a large mass of fat. "In whose absence nature had supplied another like round mass, on the right toward the liver and attached to the sphacelated part. Veins ran through the middle, like Wirsungian ducts, but without order. This sphacelated pancreas distributed a like contagion, penetrating not only adjacent

⁷⁵ P. 21.

⁷⁶ P. 17.

⁷⁷ No. XLIII.

⁷⁸ Misc. cur. Med. phys. Acad., etc., 1681, Ann., iii., 65.

Fifteen Cases of Gangrenous Pancreatitis

No.	Authority.	Sex.	Age.	Antecedents.	Symptoms.	Lesions.
I.VI	Haller and Klob; Zeitschr. d. k. k. Ges. d. Aerzte zu Wien., 1859, xv, 577.	M.	63	Always well,	For 16 days gastric disturbance, vomiting, Now pale, cachectic, thin; yellow, bitter vomit. Epigastric somewhat distended, tense, tympanitic, sensitive. Abdomen elsewhere moderately swollen. In the evening repeated nausea, vomiting, great prostration, collapse, violent epigastric pain, thence extending over whole abdomen. Traces of blood in vomit. No albuminuria. Death, after rapid collapse, on the 18th day.	The pancreas a thin, flabby, friable, grayish band soaked in fluid. It lay in an ichorous cavity, bounded by the posterior wall of the stomach, spine, and duodenum, and communicating with the stomach by three openings in its posterior wall. The pancreas was united in front by a few threads to the omental bursa. Its cells were either disintegrated, or swollen, or opaque. Certain lobules were separated from each other, in part collapsed, with intervening molecules and fat-drops. Pus-cells were present, splenic vein obstructed by a dark-red thrombus extending to the portal vein.
I.VII	Trafoyer, 1862; v. Chiari, Wiener Med. Woch., 1880, xxx, 139, 164.	M.	52	Digestive disturbances for 2 months, with decided emaciation.	Digestive disturbances for Sudden, severe colic. After several days a diagnosis of gall-stones by Oppolzer. The attacks were repeated for 3 or 4 weeks, when 18 gall-stones were discharged. Three days later another intense attack, with vomiting; prognosis grave. On the following day a slough discharged from the bowels. Recovery in 3 weeks, and the patient well 17 years later.	Rokitansky examined the slough and recognized it as the sequestered pancreas. .

LVIII.....	Chiari; Wiener Med. Woch., 1876, xxv, 29.	F.	54	Corpulent, alcoholic. For several years gastric pains and occasional vomiting after meals. Irregular defecation. Stools often black. A few attacks of jaundice, lasting 7 weeks.	Slight pains in region of stomach, jaundice and fever. Swollen abdomen, nothing abnormal painful epigastrum, nothing abnormal on palpation or percussion. Bed sore in the course of three weeks. Acute paroxysms in the 4th week. In the last weeks failing appetite, increasing debility. Death after a short agony, the illness lasting 7 weeks.	Pancreas cylindrical, brownish-black, shreds, dry, and friable. It lay in the omental cavity, which formed a spacious pus-cavity, the walls densely fibrous with purulent infiltrations of the innermost layers. The liquid contents an offensive black fluid. A round ulcer of the stomach opened into the cavity; there was also a second opening between the two, and five openings into the jejunum. There was a thrombus in the splenic vein, and necrosis of fat-tissue.
LIX.....	Chiari; Wiener Med. Woch., 1880, xxx., 142.	M.	38	Biliary colic a year ago...	Slight, nocturnal, abdominal pain for no days, not interfering with occupation. It then became more severe with sensation of twisting in left gastric region. On the 14th day suddenly awoke with persistent vomiting followed by a defecation. Violent, gastric colic. Soon anxiety, collapse, the epigastrum swollen, tense, sensitive. For a few days signs of intestinal obstruction, the abdomen swollen, the epigastrum sensitive. No fever. After repeated enemas an offensive stool and improvement. At the end of a fortnight a sudden febrile attack, lasting 3 days, with symptoms of stenosis. After a fortnight a slough was discharged from the bowels. Recovery in five weeks, the entire illness lasting some 12 weeks.	Pancreas dark-brown, friable, lying, attached only by a few rotten, fibrous threads, in the omental cavity. The latter contained also abundant ichorous, bloody fluid, and communicated with the duodenum and transverse meso-colon. Purulent infiltrations of the mesentery. Necrosis of fat-tissue. Numerous calculi in the gall-bladder. General peritonitis.
LX.....	Chiari; Loc. cit., 139..	F.	46	Strongly built, abundant fat-tissue; often suffered from cramps of the stomach.	Severe abdominal pains for some days, frequent vomit. Signs of a general peritonitis. Slight jaundice. After a chill, copious, black, offensive vomit, which continued till death. Duration of disease some three weeks.	The microscope showed merely remains of the pancreatic acini, but no evidence of hemorrhage.

Fifteen Cases of Gangrenous Pancreatitis—Continued.

No.	Authority.	Sex.	Age.	Symptoms.	Lesions.
LXI.	Israel: Virchow's Arch., 1881, lxxxii, 184.	F.	27	Typical case of diabetes. A year in the hospital, under treatment.	Head of the pancreas, not abnormal, formed the right pole of an ovoid cyst, the wall of which arises immediately from the thickened and fibrous capsule, which is intimately connected with the posterior wall of the stomach and with a small part of the colon. The contents are 300 grammes of opaque fluid surrounding the tail of the pancreas, the tip floating free. The pancreas, thus situated, is hardy, macerated, and impregnated with large hematoxilin crystals and acidular, orange crystals.
LXII.	Whitney: Boston Med. and Surg. Jour., 1884, ev., 593.	F.	Adult. Well till within four months.	In this time has had discomfort at the pit of the stomach, and debility, but is able to be about.	Pancreas large, firmly adherent to adjacent parts, which were infiltrated with discolored purulent fluid. The entire gland transformed into a dark, slate-colored, stinking mass, to within 3 cm. of its attachment to the intestine, where it was sharply defined from the remaining more normal portion.
LXIII.	Rosenbach: Chlatt, f. Chirurgie, 1882, ix, Bell., 60.	F.	57	Eight weeks ago, violent pains, without obvious cause, constipation, speedy improvement; 3 weeks ago, constipation again; for 3 days no defecation, now frequent green vomit, great prostration, marked swelling of left half of abdomen. Behind and below the dilated stomach a fluctuating tumor, immovable, size of a child's head. Laparotomy. Death in collapse after 6 hours.	Splenic vein contained a soft, dark thrombus, where it was in contact with the pancreas. Pancreas necrotic, from which arose the suspected cyst, which was an abscess between the stomach and small omentum. The contents were an opaque, stinking fluid. There was fecal accumulation from pressure of the cyst upon the upper part of the small intestines, which were adherent to it.

I.XIV.....	Räiser : Virchow's Arch., 1882, xc, 53.	F.	32	Strong, abundant fat-tissue. Four weeks ago, sudden vomiting, first slimy, then bloody and greenish. Soon violent pains in the loins and back, fever, headache. Scanty, high-colored urine. Abdomen then began to swell. Now no fever, irregular pulse, clear intelligence, abdominal pain, debility, abundant stools, albuminuria. For a few days temperature from 100° F. to 102° F., rarely normal and subnormal. Great abdominal distention, flanks dull. Five days later sudden death, preceded by increased dyspnea.	Pancreas, often appearing as if macerated, lay free, with the exception of its duodenal attachment, in a cavity holding about a litre, which was exposed by separating the fibrous and fibrinous adhesions of the root of the mesentery to the transverse mesocolon. It lay on both sides of the spine, extending to the pelvis, behind the caecum and descend- ing colon, and, in places, separated the muscles, which were covered with shreds. The contents were a greasy, grayish yellow dexturis, mixed with larger fragments, some nearly as large as a hen's egg. These ap- peared to have been shelled out of an iron- rust color, in part dark brown, in part infiltrated with blood. The wall surrounding this necrosed fat was opaque, grayish-yellow or yellowish-white, narrow, and sharply de- fined, without putrid infiltration. The mesentery contained numerous large and small opaque-white patches, with here and there, translucent colges. These had a centre of necrotic fat-tissue.
In the night, sudden, severe cramp of stomach, vomiting, chills, and sweating. A few hours later, collapsed, collapsed, restless. Severe abdominal cramps, circumcribed tenderness near navel. Temperature normal. On the following day fever and diarrhea. After temporary improvement, lasting a week, there was persistent diarrhea, pains, and tenderness of the navel, slight fever and considerable tympany just before death, on the 15th day.	Site of the pancreas occupied by a black, shred- dy, doughy, soft, gangrenous mass; these characteristics most marked in the central re- gion of the organ. The head and tail were represented by a central portion of a black, sloughy mass in which no trace of glandular structure was to be made out, which was encapsulated by the external portion. On raising transverse colon a ragged, blackish mass appeared from a rent, in which flowed a large quantity of thin, chocolate-colored fluid, also two or three soft clots, size of an egg.				
Prince and Gannett : Boston Med. and Surg. Jour., 1882, civi., 28.	M.	22	Strong, abundant fat-tissue. A week ago, im- mediately after turning a handsping, felt a sharp pain in the lower abdomen.	No cardiac source of embolism.	

Fifteen Cases of Gangrenous Pancreatitis—Continued.

No.	Authority.	Sex.	Age.	Antecedents.	Symptoms.	Lesions.
LXVI.	Homans and Gannett : Boston City Hospital, MS. Records, 1883, v. 54.	F.	49	Umbilical hernia for two years. Irreducible for two weeks, with pain and swelling. Abundant fat-tissue.	On the day after entering hospital, for treatment of hernia, vomited breakfast, severe paroxysms of colic, small, flickering pulse. Nausea and bilious vomiting persisted. On the next day, the face became anxious and pained, the pulse too, at times indistinguishable, the temperature normal. The pulse became 140. 1., 100.8° F., and she became pale, comatose, and gasping, and died on the 4th day.	Hemorrhagic infiltration, and gangrene of the pancreas. Circumscribed peritonitis, gangrenous phlebitis. Acute pleurisy and pericarditis. Thrombosis of the splenic vein.
LXVII.	Whittier and Fitz : Mass. Genl. Hos- pital, MS. Records, 1884., v. 54.	M.	49	In past three years, three attacks of jaundice, bilious vomit, severe pains and abdominal tenderness, most marked near xiphoid cartilage.	After dinner burning in stomach, nausea, much abdominal pain. On the following day jaundice, bilious vomiting. The latter persisted for several days, with frequent belching, and loose defecations. The abdomen became resonant except in the right flank, generally tender; temperature on the 8th day, 100.8° F. Pulse and respiration rapid. On the tenth day he fell to the floor while trying to leave the bed, and soon died conatus.	Hemorrhagic infiltration necrosis, and sequestration of the pancreas, and multiple disseminated necrosis of the subperitoneal fat tissue.
LXVIII.	Mader : Ber. d. k.k. Kräkkenanst. Rud. Stift in Wien, 1884.	M.	42	For four years repeated attacks of vomiting, without colic, followed by jaundice lasting four or five days.	During first 5 days paroxysms of abdominal pain, swelling of abdomen, vomiting, jaundice, 2 to 3 daily chills, fever; on the 6th day, T., 100.4° F. Some green vomit. Pulse hardly quickened, no albuminuria. Abdomen inordinately distended and resistant, very sensitive, dense, and dull in left upper quadrant. Sudden collapse on the 9th day. Death on the 13th day.	Tail and part of the body of the pancreas very soft, gray, discolored, infiltrated with a thin, ichorous fluid; the peri-pancreatic tissue partly purulent, partly ichorous. Spleen greatly enlarged, soft; splenic vein contains a soft, partly puriform thrombus, extending to portal vein. Acute leptomenitis.

LXIX. Gerhardi; Virchow's Arch., 1886, cvi, 310.	M.	36	Powerful frame, abundant fat. In habit of drinking. From early youth attacks of abdominal pain, without constipation. A year ago the attacks became more frequent.	After a hard day's work intense pain in Pancreas dense, nodular, with hemorrhagic coating, acini dull, yellowish-gray. Dry hemorrhagic masses with yellow spots of softening. In the head is fatty softening, and a hemorrhagic infiltration extending into the surrounding tissue. At the back of the pancreas a narrow line of hemorrhagic and necrotic tissue, beneath it the duct, with necrotic wall. Left kidney and supra-renal capsule showed extensive subperitoneal hemorrhage. The microscopic examination of the pancreas showed necrosis of the fat tissue with hemorrhagic processes in the tissue surrounding the fat-lobules.
LXX. Foster and Fitz; MS. Notes, 1887, v. 57.	M.	59	Weight, 200 lbs. Strong and healthy. Two weeks ago thrown from carriage, but did not consider himself injured.	The attack began with intense pain in the left abdomen, without fever, apparent improvement for 3 days, then labored and jerking breathing, rapid, extreme exhaustion, and death in ten days after the onset of the pain.

parts, but even the diaphragm, consuming the left lobe of the lung as in phthisis."

The liver is said to have resembled grumous blood, in color and in substance. There were several calculi in the gall-bladder.

"Other membranes were adherent at the bottom of the gall-bladder and held another stone larger than all."

Although the evidence does not permit an exact diagnosis to be made it would seem as if the sufferings and death of this individual were rather attributable to biliary calculi than to pancreatic disease. The penetration of the diaphragm and the consumption of the left lung suggest that post-mortem softening of the stomach may have aided in producing the described appearances. The clinical history, brief as it is, affords quite a different picture from that to be presented as connected with pancreatic gangrene.

Bonetus⁷⁹ credits Barbette with stating that in a case of obstinate vomiting the pancreas was found wholly putrid, rather sphacelated. Again,⁸⁰ he refers to the statement of Verzaschka that Glaserus found a semi-putrid pancreas in a case of dropsy.

Bonetus himself⁸¹ records a case of dropsy in a boy in whom the pancreas is stated to have been semi-putrid.

In Lieutaud⁸² there is extracted the case of a woman with obstinate vomiting, severe renal symptoms, and pubic pain, in which the pancreas was semi-putrid, almost destroyed.

Also⁸³ that of a girl with swollen abdomen, hypogastric pain, purulent urine, and diarrhoea. The omentum and a large part of the mesentery were rotten. The liver filled almost the entire abdominal cavity. The pancreas was putrid and the whole left kidney purulent.

Again,⁸⁴ in an infant, with dropsy, there was found a putrid omentum and pancreas. He reports⁸⁵ that Helvius found a sphacelated pancreas, omentum and mesentery, also a shrivelled and putrescent liver, with a gall-bladder containing more than a hundred calculi, in a man sixty years of age, who was seized with gastric pain, obstruction of the liver, and dyspnœa; there was black jaundice and œdema of the legs.

He also⁸⁶ refers to a case of extreme dilatation of the bile-duct, where the head of the pancreas was swollen, dense, scirrhouς, and pressed upon the opening of the cystic duct. The left portion of the pancreas was putrid.

⁷⁹ Sepulchretum, 1700, lib. iii., sect. viii., obs. 54, vol. ii., 113.

⁸⁰ Op. cit., ii., lib. iii., 478.

⁸¹ Op. cit., ii., liv. iii., 415.

⁸² Op. cit., i., 34.

⁸³ Op. cit., i., 62.

⁸⁴ Op. cit., i., 64.

⁸⁵ Op. cit., i., 183.

⁸⁶ Op. cit., i., 236.

Finally, he credits ⁸⁷ Bonetus with reporting a case of oft-recurring, obstinate tertian fever, in which the pancreas and mesentery were found somewhat corrupted and sanguineous.

Schmidtmann ⁸⁸ speaks of finding induration of the pancreas with appearances of inflammation and beginning gangrene in a case of chronic suppurative nephritis with destruction of the bladder.

The case reported by Portal ⁸⁹ is perhaps the first which demands recognition as illustrating the relation of pancreatic gangrene to hemorrhagic pancreatitis. He writes as follows :

"Gangrene of the pancreas is the frequent result of inflammation. I have found it in several corpses, and especially in that of a merchant of St. Denis Street, who, during a period of more than two years, suffered from severe attacks of colic. They were deep-seated, below the navel, and were often preceded or followed by nausea or vomiting. There was neither swelling nor induration of the lower abdomen; no dryness of the tongue nor thirst. He became much emaciated, the pains increased, the pulse quickened, the heat of the skin became acrid and very strong. The slightest touch of the lower abdomen became very painful. The urine was scanty and red. This state lasted some twenty days, when the patient died unexpectedly. I was present at the autopsy."

"The pancreas was violet-red and soft, a black moisture escaped from its surface, it was almost wholly gangrenous. The stomach and the duodenum appeared inflamed in places."

Although the above case is probably one of the disease now under consideration, the lack of detail in the clinical statement and account of the anatomical appearances makes its value rather historical than useful in determining the relations of the hemorrhage to the gangrenous affections of the pancreas.

Gendrin ⁹⁰ reports a case which is likely to belong to the series, but which is deprived of a considerable part of its possible value by the lack of sufficient details, clinical as well as anatomical. He states : "We have seen a vast cavity in the region of the pancreas communicating with the jejunum, which was perforated an inch from its origin. The pancreatic tissue was lost in a dense, friable, reddish mass which formed the wall of the cavity, which was filled with a grayish, very fetid pus. The surrounding cellular tissue and the intestinal walls united in forming this suppurating tumor."

⁸⁷ Op. cit., i., 246.

⁸⁸ Hufeland's Journ. d. pr. Arzneykde, 1799, vii., 4te St. 16.

⁸⁹ Anat. Med., 1803, v., 353.

⁹⁰ Hist. anat. des Inflamm., 1826, ii., 239.

The table of fifteen cases (*vide p. 46*) of pancreatic gangrene represent all, with the above possible exceptions, I have been able to collect. Twelve of them have been observed in the past eight years, five of them have occurred in Boston or its vicinity, and three of them are now published for the first time.

The records of the Boston City Hospital give the following details concerning Case LXVI.: The patient, married, forty years of age, with abundant fat-tissue, strained herself two years before her death, while lifting a heavy tub. There were immediate umbilical pain and swelling, but she was not compelled to give up work. Until two weeks before she entered the hospital she was able to replace the umbilical hernia. Since then the swelling and pain have increased.

On the day following her admission as patient she vomited after breakfast, and was seized with a severe paroxysm of colic. The pulse became small and flickering. On the following day there were nausea and bilious vomiting, the pulse remained very weak, at times not perceptible, and the face was pinched and anxious. The temperature was not elevated. On the third day the vomiting had ceased, but the face was flushed; the temperature, 100.8° F.; and the pulse, 144. She became comatose the next day and died. Pallor, gasping respiration, a temperature of 100.8° F., and a pulse of 124 were recorded. The coils of intestine in the immediate vicinity of the pancreas were united together, and to the diaphragm, by recent fibrinous adhesions. On removing these the pancreas was found to be doubled in size, of a dark-red color, and of a somewhat diminished density. On section, the tail was of a nearly uniform red color, soft, and its tip was shreddy. The duodenal portion was of normal density and of a mottled red and gray color.

The splenic vein was filled with a reddish thrombus, in places softened at the centre. The under-surface of the diaphragm presented a dirty grayish-white, shreddy appearance. A section through the diaphragm showed it to be four times as thick as usual, and to contain numerous small collections of dirty-gray, puriform fluid. The diaphragmatic tissue was quite shreddy. There was an acute fibrinous pericarditis and a sero-fibrinous pleurisy. The umbilical hernia was omental and adherent.

Case LXVII. has the following record: The patient was an Irish laborer, forty-nine years of age; abundant fat-tissue.

In the past three years he has had three attacks of jaundice, with bilious vomiting, severe pain and tenderness over the xiphoid cartilage. He has suffered also

from severe paroxysms of abdominal pain, and had been told by a physician during the past winter that he had passed a gall-stone.

After dinner he suffered from a burning sensation in the stomach, followed by nausea and severe abdominal pain, not paroxysmal but increased on motion. He became jaundiced on the next day and vomited a dark-green fluid, and considerable mucus. For the subsequent three days the vomiting persisted, and there were frequent gaseous and bitter eructations, also several loose, dark-green dejections.

He entered the hospital on the fifth day. The jaundice was conspicuous; the abdomen was resonant, except in the right flank, and sensitive. The pulse was 100, and the temperature rose abruptly from 97.4° F. to 100.8° F. During the subsequent four days the diarrhoea persisted. The urine contained a trace of albumen and a variety of casts. The pulse varied from 120 to 150, the respirations were very rapid, and the temperature remained moderately elevated.

On the eighth day he dressed himself, but did not seem conscious of his actions. He became mildly delirious on the following day, and while trying to escape from the ward fell forward, was temporarily unconscious, and his pulse could not be counted. The temperature became subnormal, but rose to 100° F. in the evening. On the tenth day, while trying to leave the bed, he fell to the floor, his pulse became weaker and more rapid, his breathing resembled the Cheyne-Stokes rhythm, and he died comatose.

The posterior wall of the stomach and the upper part of the mesentery were united by fibrinous adhesions to the pancreas, which lay in a cavity, within a spongy meshwork, infiltrated with dirty-green fluid. The pancreas was dark brown, dry, and firm. On section the lobules were indistinct, and the surface granular. Numerous opaque-white patches were seen, resembling those to be described in connection with the abdominal fat tissue. The splenic vein contained a mixed thrombus four inches long and one-half the thickness of the little finger, and continued into several of the pancreatic branches. The spleen was soft and small. The liver was moderately granular and fatty. The gall-bladder was contracted about several calculi, the largest nearly the size of the end of the thumb, and projecting into the cystic duct. The walls were thick and tough; the mucous membrane thin, and streaked with opaque-white lines. The cystic and common ducts were dilated.

The subperitoneal fat-tissue of the abdominal wall, mesentery, omentum, and perinephritic region contained nu-

merous superficial and deep-seated small, circumscribed, rounded, opaque-white, and saffron-colored patches. In general they were elongated, measuring an inch by a quarter of an inch. Rarely they were nodular, as large as a filbert, and on section contained dark-brown, discolored centres. Sections of the frozen fat-tissue showed numerous cavities containing a shreddy tissue, infiltrated with opaque-pink fluid of creamy consistency. Microscopical examination of the fresh specimens showed numerous leucocytes and large round-cells, with granular detritus, opaque-white specks, and bundles of small acicular or rod-like crystals.

There was nothing abnormal in the appearance of the stomach or intestines.

The microscopic examination of the hardened pancreas shows a small quantity of interlobular fat-tissue. In this are numerous islets of necrosis, their appearances being essentially the same as those found in the parapancreatic fat-tissue.

The larger ducts are filled with clumps of coherent, detached, cylindrical epithelium, with distinctly stained nuclei.

The gland-cells in certain parts, especially in the immediate vicinity of the necrotic fat-tissue, are swollen, granular, confluent, and without evident nuclei. The outlines of the acini are irregular or indistinct. Certain of the lobules present a diffused infiltration of round-cells. Many of the acini show a central accumulation of homogeneous hyaline material, with corresponding flattening of the gland-cells.

Sections of the subperitoneal and parapancreatic fat-tissue present numerous patches, varying in extent and shape, all more or less rounded, oblong, or leaf-like. They are sharply defined by a limiting zone, varying in width, of small, round-celled infiltration between the fat-cells. Next this cellular layer is often found a narrow, orange-colored streak, in which are frequent granules and round clumps of small, orange-colored acicular crystals. Within the patch the outlines of the fat-cells are often distinct over considerable areas, but elsewhere are almost wholly, if not entirely, obliterated by the clusters of large and long acicular crystals and granular material. These crystals were isolated, dissolved, and recrystallized by Dr. Harrington, assistant in chemistry at the Harvard Medical School, and are pronounced by him to be identical with those obtained from ordinary tallow.

In addition to the crystals and granules, bacteria were found, both as circumscribed colonies within, and as diffused accumulations without, the patches.

In the fat-tissue surrounding the patches of necrosis are

occasional hemorrhagic spots, with distinct outlines of red blood-corpuscles. Small and irregular patches of leucocytes, without intercellular substance, are to be seen, occupying more space than that of several fat-cells.

Occasionally, elongated bands are found considerably wider than any visible blood-vessels. They are composed of agglomerated round-cells, with solitary larger corpuscles containing granular pigment. At each side of the central streak are numerous isolated, round and larger, flat, polygonal cells with large nuclei. These, in turn, are defined externally by a margin of clustered leucocytes. Arteries and veins are free from obvious changes.

The following record of Case LXX. is given as fully as possible. It is to be regretted that neither the specimen nor the detailed description of the pancreas was preserved. A gentleman, fifty-nine years of age, temperate, strong, and healthy, weighing two hundred pounds, was thrown from his carriage, but did not consider himself injured. Four days later he was seized with intense pain in the left abdomen, associated with nausea and vomiting. At the outset the pulse was 80, and the respiration 24. There was no fever at any time. After a few days the pain and tenderness were relieved. From the outset extreme exhaustion was a conspicuous symptom. Eventually rapid and labored breathing came on, and the patient died on the tenth day. A memorandum on the back of the letter accompanying the specimens, and giving the clinical details, states that the conspicuous lesions were a gangrenous peripancreatitis and necrosis of the mesenteric fat-tissue. From the lack of further details the question might be raised as to the exact method of origin of the gangrene and necrosis. At the time, I was satisfied that the case was analogous to that which immediately precedes, viz., Case LXVII.

Of these fifteen cases seven were males and eight females. Their ages were as follows :

Years of age.	Number of cases.
From 22-25.....	1
" 25-30	1
" 30-35	1
" 35-40	2
" 40-45	2
" 45-50	2
" 50-55	2
" 55-60	2
" 60-63	1
Past middle life.....	1
	—
	15

They were from all walks and conditions of life. Five were very fat, one was decidedly lean ; five were strong, and two of them were addicted to alcoholic drinks.

Eight of these patients had been subject to earlier more or less repeated attacks of digestive disturbance. These were always attended with pain, usually referred to the region of the stomach or stated to be biliary colic. They were frequently accompanied with vomiting, and, in one-third of the number, with jaundice. Constipation, or irregular defecation might occur, and in the latter case the stools were black.

At first sight the etiological importance of perforating gastric ulcer and of gall-stones seems immediate, as illustrated by Cases LVII., LVIII., and LXVII.

The comparison of these cases with others in the series would suggest that these affections were more important from the associated inflammation of the mucous membrane, with its opportunity of extension into the pancreatic duct, than from the actual or possible perforation of the biliary or digestive canal.

A traumatic cause for the fatal illness was possible in two instances.

In the one the patient was seized with a sudden pain in the lower abdomen, while turning a handspring, a week before the fatal illness. In the other the patient was thrown from his carriage five days previous. One person was seized with her attack while under treatment for an umbilical hernia of two years' duration. A mid-day meal and a hard day's work were each the immediate antecedent of the attack.

The illness usually, in four-fifths of the cases, began suddenly, without definite cause, with abdominal pain. This was rarely slight, but often intense and severe. It was referred to the stomach, left hypochondrium, navel, mid-abdomen, and left loin and back. The pain might be constant or paroxysmal like a biliary colic, and a diagnosis of gall-stones was made in one instance.

Vomiting was the next symptom of importance, being recorded in three-fifths of the cases. Partly digested food was ejected, or a viscid or slimy fluid, often green, sometimes black or bloody. Constipation was, at times, so conspicuous that, in connection with the other symptoms, a diagnosis of intestinal obstruction was made in three cases, and laparotomy performed in two. On the contrary, frequent bilious stools might occur.

The urine might contain albumen and casts. In one case an excess of indican was repeatedly sought for -- in vain.

Jaundice, usually slight, occurred after a few days in one-fifth of the cases.

Chills were occasional, sometimes at the onset, and fever was frequent after a few days. The temperature was likely to be low, in the vicinity of 100° F., although

it might be as high as 104° F. There might be no conspicuous fever throughout the course of the disease.

Swelling of the abdomen was present in one-half of the cases, usually occurring as a late symptom.

It might be slight or enormous, general, or limited to the epigastrium, or to the left half, where a fluctuating tumor was to be recognized. The abdominal swelling was usually tympanitic, although dulness might be present in the flanks. The spleen was palpable in a single instance, and the parotid became acutely swollen in another case.

As the disease ran its course weakness became apparent. Vomiting, perhaps diarrhoea, and abdominal pain were noticeable, suggestions of peritonitis were frequent, and symptoms of collapse were likely to take place, being followed more or less rapidly by death, which occurred as follows :

On the 4th day in.....	1 case.
" 5th "	1 "
" 10th "	3 "
" 13th "	1 "
" 15th "	1 "
" 18th "	1 "
At the end of 3 weeks in.....	1 "
" 5 "	1 "
" 7 "	1 "
" 8 "	1 "
Not stated in.....	1 "

Two patients recovered with the discharge of a slough through the bowel, one at the end of eight weeks. One of these patients was living seventeen years later.

The diagnosis lay between intestinal obstruction, biliary calculi, and peritonitis.

The appearance of the pancreas varied according to the duration of the disease. About the fourth day⁹¹ the pancreas may be doubled in size, dark red, and of somewhat diminished consistency. It may be red, on section, or mottled red and gray. The tip may be shreddy, or the entire gland may be transformed into a dark, slaty-colored, stinking mass. The adjacent parts may be infiltrated with a discolored, purulent fluid, or the coils of intestine near the pancreas may be united by recent adhesions together and to the under-surface of the diaphragm.

The latter may show a dirty grayish-white, shreddy appearance, and its thickened substance may contain small collections of dirty-gray puriform fluid, the tissue itself being quite shreddy.

On the tenth day⁹² the pancreas may be dark brown, dry, firm. It may have a hemorrhagic coating or lie in a sponge-like meshwork infiltrated with dirty-green fluid.

⁹¹ Cases LXII., and LXVI.

⁹² Cases LXVII. and LXIX.

On section there may be dry hemorrhagic masses, with yellow spots of softening, or the lobules may be indistinct, with intervening opaque-white patches, like those to be found in the neighboring fat-tissue. The hemorrhagic infiltration may extend beyond the gland. The wall of the duct and the overlying tissue may be necrotic and hemorrhagic. The perinephritic fat and that near the suprarenal capsule may contain extensive hemorrhages.

Toward the end of the second week⁹³ the pancreas may be a soft, black, shreddy, sloughy, gangrenous mass, the central part being encapsulated by the peripheral portion. Between the pancreas and the transverse colon may be a large quantity of chocolate-like fluid, and large, bluish-black clots. Or the tail and a part of the body may be soft, gray-discolored, and infiltrated with a thin, ichorous fluid, while the parapancreatic tissue is partly purulent and partly ichorous.

A few days later⁹⁴ the pancreas may be a thin, flabby, friable, grayish band, lying in a cavity behind the stomach and attached by a few shreds to the omental wall. The cavity may contain ichorous fluid and communicate with the stomach by several openings with frayed edges.

At the end of three weeks⁹⁵ the dark-brown pancreas may lie nearly free in the omental cavity, attached only by a few rotten shreds of fibrous tissue. The cavity may contain abundant ichorous bloody fluid, and communicate with the duodenum. During the fourth and fifth weeks the pancreas may be discharged as a slough from the bowels.

In the fifth week⁹⁶ the pancreas may lie free, as if macerated, in a cavity extending behind the cæcum and descending colon, on both sides of the spine, as far as the pelvis. The contents may also be a greasy, grayish-yellow detritus, with fragments of necrotic fat-tissue nearly as large as hens' eggs. The latter are apparently sequestered from spaces with walls of a dark-brown or iron-rust color.

At the end of seven weeks⁹⁷ the pancreas may be transformed into a cylindrical, shreddy mass of brownish-black, friable tissue. This may lie in the omental cavity, which is filled with offensive, black fluid and communicates with the stomach and jejunum.

Thrombosis of the splenic vein frequently accompanies the pancreatic lesion, and is usually parietal. The thrombus in the early stages is soft and dark red, or it may be of a reddish-gray color. It has been found partly puriform, and extending to the portal vein, at the end of the second week.

⁹³ Cases LXV. and LXVIII.
⁹⁶ Case LXIV.

⁹⁴ Case LVI.

⁹⁵ Case LX.
⁹⁷ Case LVIII.

A little later it has been found completely obstructing. The spleen may be soft, and is either large or small. Disseminated fat-necroses are often seen.

From the frequent mention of the position of the pancreas in the omental cavity, filled with ichorous pus, it is evident that an acute peritonitis with liquid exudation is a frequent, if not the usual, occurrence. The pus may be prevented from entering the general peritoneal cavity by adhesive obliteration of the foramen of Winslow.

Peritoneal adhesions between coils of intestine are not infrequent, especially in the vicinity of the root of the mesentery. A general suppurative peritonitis is of comparatively rare occurrence.

The inflammatory process may be extended to the pleural and pericardial cavities, and an acute leptomeningitis has been found on the thirteenth day. At a late stage of the disease, death may result from pulmonary embolism.

The possibility of an arrest of the processes resulting in pancreatic necrosis and parapancreatitis is evident from Case LX. Although the patient died of diabetes, the symptoms of which lasted at least a year, the tail of the pancreas, was flabby and macerated, and its tip lay free in a cyst arising immediately from the pancreatic capsule.

It is obvious from the anatomical appearances in this group of cases of gangrenous pancreatitis, para- and peri-pancreatitis, that the lesions are associated with a hemorrhagic pancreatitis in a considerable number of cases. In at least one-half there is mention of hemorrhage into the pancreas or of such discoloration as to suggest a hemorrhage.⁹⁸

A comparison of the clinical history of this series of cases with that of hemorrhagic pancreatitis will show a strong resemblance in predisposing causes, and in the nature of the symptoms. These are essentially identical in nearly all. In many of the remaining cases the symptoms are those which would favor the diagnosis of a hemorrhagic pancreatitis.

In any event, they represent the termination of acute pancreatitis in gangrene, with an extension of the process to the continuous tissue.

Viewing the subject from the anatomical side, it is evident that cases of hemorrhagic pancreatitis may terminate fatally within a few days, either with or without necrosis of the gland and parapancreatic fat-tissue. They may also prove fatal in from one to four weeks, in consequence of an extension of the disease to the para- and peri-pancreatic tissues, with gangrene of the parts concerned.

⁹⁸ See Cases LVIII., LX., LXI., LXII., LXV., LXVI., LXVII., LXIX.

⁹⁹ Case XIX.

¹⁰⁰ Virchow's Arch., 1872, lvi., 541.

DISSEMINATED FAT-NECROSIS.—Considerable prominence has necessarily been given to the necrosis of fat-tissue associated with pancreatic inflammations.

Hooper¹⁰⁰ probably intended to describe the appearances due to this condition, but Ponfick¹⁰⁰ first distinctly recognized the condition. He called attention to a disseminated necrosis of bone-marrow in a case of empyema and extensive amyloid degeneration. The appearance was that of innumerable, submiliary, yellowish-white specks in the amber-colored marrow. They proved to be composed of an agglomeration of large cells crowded with fine granules. These were enormous granular corpuscles, which, from their size and shape, were regarded as identical with fat-cells. There were also narrow and elongated, fatty-degenerated cells, so disintegrated in many places as to form a finely granular detritus. Ponfick attributed these spots of necrosis to a fatty degeneration of the marrow.

Balser,¹⁰¹ who became an assistant of Ponfick, then professor at Göttingen, found similar appearances in the marrow and in the subpericardial fat, each in an old man. In the examination of twenty-five unselected cases, he found such patches in the region of the pancreas in five instances. Two of these patients died of cancer of the stomach, and the remaining three were cases of pulmonary consumption, hepatic cirrhosis, and aortic endocarditis respectively. There remain two additional cases in which he found fat-necrosis.¹⁰²

These he regarded as illustrative of the fatal effect of a disease—fat-necrosis—which, when extensive, was associated with old and fresh hemorrhage. Such hemorrhages near the pancreas might produce death in the manner resembling that described by Zenker as pancreatic apoplexy. He regarded the fat-necrosis as the result of an excessive growth of fat-tissue which destroyed the tissue it surrounded. From its association it was a special source of danger to fat persons. His conclusion is:¹⁰³ “An excessive growth of the fat-cells near the pancreas occurs in many men. It may become so excessive, in very fat people, that a large part of the abdominal fat dies, and it thus proves fatal either on account of the quantity destroyed or the associated hemorrhage.”

Chiari¹⁰⁴ had also found fat-necrosis associated with pancreatic disease,¹⁰⁵ although in his published report he made no note of the characteristic appearances. He confirmed Balser's statements concerning the occurrence of fat-necrosis in and near the pancreas. Since he had observed

¹⁰¹ Loc. cit.

¹⁰² Cases XXIV., and LXVI.

¹⁰³ Loc. cit., 534.

¹⁰⁴ Prager med. Woch., 1883, viii., 285.

¹⁰⁵ Cases LVIII., and LX.

it in five out of six cases of pancreatic disease, a certain connection between the two was suggested. Three of these were cases of sequestration of the pancreas. The remaining three were a phthisical diabetic, a case of chronic Bright's disease and interstitial pneumonia, and an infant with congenital syphilis. He found no evidence of an excessive circumscribed growth of fat-tissue as claimed by Balser, but regarded the necrosis as a degenerative process, analogous to the retrograde metamorphosis in other tissues, and the result of a severe marasmus. He admitted it as a cause of pancreatic hemorrhage, and that it might, hence, prove fatal. He did not regard the sequestration of the pancreas as the result of this necrosis, since he could not understand how extensive circumscribed necrosis about the pancreas could isolate so large an organ.

Finally, Van Giesen¹⁰⁶ presented to the New York Pathological Society microscopical sections illustrative of fat-necrosis. They came from the pancreas of a woman, eighty years of age. There were two nodules, the larger 5 mm. in diameter. Nothing is stated with reference to any associated lesions, and the necroses were regarded as degenerative.

There is a general agreement as to the appearance of these nodules. They are multiple, disseminated, are found in the subperitoneal fat-tissue of the abdominal wall, mesentery, omentum, and in that within and around the pancreas. Chiari¹⁰⁷ found them also in the subpericardial, subpleural, and subcutaneous fat. Their presence in marrow has already been mentioned.

Such nodules were present in one case of pancreatic hemorrhage, certainly in one, probably in two, cases of acute suppurative pancreatitis. They were seen in six cases of hemorrhagic and in six of gangrenous pancreatitis. These nodules, in most of the cases, occurred in great numbers, the smallest not larger than a pin-head, and strongly suggestive of miliary tubercles or malignant new formations. The largest were of the size of a hen's egg. All were more or less rounded, of an opaque-white or yellowish-white color, and of soft, tallowy consistency. They occurred alone or in groups, superficially and deep-seated. The smallest were often surrounded by an injected, vascular wreath, while many were bounded by a distinct, narrow, reddish-brown zone indicative of hemorrhage.

Chiari¹⁰⁸ found the larger nodules (although he does not state in which of his six cases) incrusted with lime, and surrounded by a distinct, fibrous capsule, from which threads occasionally ran into the surrounding fat-tissue.

¹⁰⁶ N. Y. MEDICAL RECORD, 1888, xxxiii., 477.

¹⁰⁷ Loc. cit., 285.

¹⁰⁸ Loc. cit., 299.

The tallowy material could be readily picked out of these nodules, and, when examined microscopically, consisted largely of acicular crystals resembling those found in fat, in addition to fat-drops and a granular detritus. Dr. Harrington's micro-chemical examination of these crystals shows their identity with those obtained from tallow. He regards them as stearine. In this view he confirms the conclusion reached by Balser.¹⁰⁹

The microscopical appearances have already been described in sufficient detail.

Balser states¹¹⁰ that his examination shows that the same process is concerned in the mild and fatal cases. Neither he nor Chiari was able to find any evidence of a bacterial or mycotic process, nor was the latter able to discover any changes in the neighboring vessels. The microscopical appearances found in Case LXVII. make evident certain features in the more serious fat-necrosis which supplement the results described by other observers. Tracts of round-celled infiltration were found at the border of the patches. Chiari also states that the fibrous threads continued from the capsules were infiltrated with round-cells. The surrounding fat-tissue gave frequent evidence of an acute lymphangitis, of abscesses, and of thrombosis. Bacteria were found in and near the patches of necrosis. They were likewise present in a neighboring vessel and in a venous thrombus. The association of these appearances with the evidences of fat-necrosis indicate most directly that the latter condition, in fatal cases at least, instead of being simply the result of a hyperplasia or of a degeneration, is connected with an acute inflammatory process somewhat akin to the phlegmonous inflammation of the subcutaneous fat. The cause of its dissemination would thus, probably, depend upon the transfer of an infecting material, either through vascular currents, especially lymphatics, or by direct inoculation of the peritoneum in case of the superficial nodules. The multiple disseminated fat-necrosis found associated with fatal pancreatic disease is thus to be regarded as the result of the inflammation of the fat-tissue extended from the pancreas or its vicinity. The pancreas is usually the seat of the primary process, but the necrotic inflammation of the fat-tissue may be secondary to a possible primary lesion of the biliary tract or stomach, as suggested by Cases LVII. and LVIII.

The spots of dead fat-tissue observed in the marantic cases may be degenerative, as claimed by Ponfick and Chiari. They certainly are neither necessarily nor exclusively found in fat persons. There is no confirmatory

¹⁰⁹ Loc. cit., 522.

¹¹⁰ Loc. cit., 528.

evidence of their hyperplastic nature. The inflammatory fat necroses, in most cases, were associated with evidences of putrefactive conditions.

It would thus appear that there is a necrobiotic necrosis of the fat-tissue, and an inflammatory necrosis, the latter tending to become gangrenous, both of which may be found within or near the pancreas. The inflammatory and gangrenous varieties are of especial importance in permitting the sloughing of the pancreas, and in most instances are the result of an acute inflammation of this gland.

Although the serious varieties of fat-necrosis may be recognized as causes for sequestration of the pancreas, their relation to pancreatic hemorrhage must be expressed in different terms from those employed by Balser and Chiari.

A simple, necrobiotic fat-necrosis may be associated with fatal pancreatic hemorrhage, as suggested by Case V., but there is no necessary etiological significance in this association. Most fatal cases of pancreatic hemorrhage occur without either variety, and the simple necrosis usually takes place without hemorrhage.

When the severe varieties of fat-necrosis accompany pancreatic hemorrhage, inflammation of the pancreas is present. The fat-necrosis cannot be regarded as the essential cause of the hemorrhage in such cases, since it occurs in suppurative pancreatitis when there is no hemorrhage in the pancreas. Furthermore, when hemorrhages are found near the necrotic patches, they are usually very slight, and limited to the immediate vicinity of the patch.

The evidence presented in this paper is intended to show that: Acute inflammation of the pancreas is a well-characterized disease, of much greater frequency than has generally been thought. Its appreciation is deemed of consequence, because it usually represents a serious complication of what is generally regarded as a relatively simple affection, viz., gastro-duodenitis. It is an important cause of peritonitis, and one readily overlooked. It has been repeatedly confounded with acute intestinal obstruction, and has thus led in several instances to an ineffective laparotomy.

Acute pancreatitis commonly originates by the extension of a gastro-duodenal inflammation along the pancreatic duct. It may also be induced by the occurrence of hemorrhage in the pancreas, which, in turn, may be of traumatic origin, although usually arising from unknown causes. The pancreatic hemorrhage may likewise be secondary to inflammation of the pancreas.

The anatomical varieties are the suppurative, hemor-

rhagic, and gangrenous. The first may be acute, but is usually subacute or chronic. The second is generally peracute or apoplectiform. The gangrenous variety runs an acute course.

Suppurative pancreatitis may result in an evacuation of the abscesses into the stomach or duodenum. They may open into the cavity of the great omentum, which, transformed into a large peritoneal abscess, may, in turn, open into the digestive tract. Pylephlebitis and abscesses of the liver may result. Disseminated fat-necrosis is comparatively infrequent.

Hemorrhagic pancreatitis usually proves fatal in from two to four days. The gross lesions are then those of hemorrhage within and near the pancreas, extending into the subperitoneal fat-tissue, perhaps as far as the pelvis. Disseminated fat-necrosis is common.

Gangrenous pancreatitis, although it may be secondary to a perforating inflammation of the gastro-intestinal or biliary tracts, usually results from a hemorrhagic pancreatitis, and proves fatal in the course of a few weeks. The gangrenous processes extend to the parapancreatic tissue, and produce more or less complete sequestration of the pancreas. The peritoneal wall of the omental cavity becomes inflamed, that covering the pancreas may be destroyed, and the sequestered gland may lie in the omental cavity, soaked in pus, and attached only by a few shreds. Both pus and pancreas may be discharged into the intestine. Splenic thrombo-phlebitis is not uncommon, but hepatic abscesses are rare. Disseminated fat-necrosis is frequent.

The common symptoms of acute pancreatitis are sudden, severe, often intense, epigastric pain, without obvious cause, in most cases followed by nausea, vomiting, sensitiveness, and tympanitic swelling of the epigastrium. There is extreme prostration, frequent collapse, low fever, and a feeble pulse. Obstinate constipation for several days is the rule, but diarrhoea sometimes occurs. If the case does not end fatally in the course of a few days, recovery is possible, or a recurrence of the symptoms in a milder form takes place, and the characteristics of a subacute peritonitis are developed.

It is evident that all treatment, at the outset, can be nothing but palliative. With the establishment of an omental peritonitis is the opportunity for the surgeon. The possibility of the successful removal of the gangrenous pancreas is suggested by the healthy condition of a patient seventeen years after he had discharged this organ from his bowels.

The spots of dead fat-tissue observed in the marantic cases may be degenerative, as claimed by Ponfick and

Chiari. They certainly are neither necessarily nor exclusively found in fat persons. There is no confirmatory evidence of their hyperplastic nature. The inflammatory fat-necroses, in most cases, were associated with evidences of putrefactive conditions. It would thus appear that there is a necrobiotic necrosis of the fat-tissue, and an inflammatory necrosis, the latter tending to become gangrenous, both of which may be found within or near the pancreas. The inflammatory and gangrenous varieties are of especial importance in permitting the sloughing of the pancreas, and in most instances are the result of an acute inflammation of this gland.

Although the serious varieties of fat-necrosis may be recognized as causes for sequestration of the pancreas, their relation to pancreatic hemorrhage must be expressed in different terms from those employed by Balser and Chiari.

A simple, necrobiotic fat-necrosis may be associated with fatal, pancreatic hemorrhage, as suggested by Case V., but there is no necessary etiological significance in this association. Most fatal cases of pancreatic hemorrhage occur without either variety, and the simple necrosis usually takes place without hemorrhage.

When the severe varieties of fat-necrosis accompany pancreatic hemorrhage, inflammation of the pancreas is present. The fat-necrosis cannot be regarded as the essential cause of the hemorrhage in such cases, since it occurs in suppurative pancreatitis when there is no hemorrhage in the pancreas. Furthermore, when hemorrhages are found near the necrotic patches, they are usually very slight, and limited to the immediate vicinity of the patch.

Conclusions.—The evidence presented in this paper is intended to establish the fact that acute inflammation of the pancreas is both a well-characterized disease and one which is much more frequent than is generally thought. It is of great consequence that it should be recognized, for the following reasons: It represents a serious complication of what, by itself, is a relatively simple affection, viz., gastro-duodenitis; it is an important cause of peritonitis, and one readily overlooked; it has been repeatedly confounded with acute intestinal obstruction, and has thus led, in several instances, to an ineffective laparotomy—an operation which, in the early stages of this disease, is extremely hazardous.

Method of Origin.—Acute pancreatitis commonly originates by the extension of a gastro-duodenal inflammation along the pancreatic duct. It may also be induced by the occurrence of hemorrhage in the pancreas. This may be of traumatic origin, although usually arising from un

known causes. The pancreatic hemorrhage may likewise be secondary to inflammation of the pancreas.

Pathological Anatomy.—The anatomical varieties are the suppurative, hemorrhagic, and gangrenous. The first may be acute, but is usually subacute or chronic. The second is generally peracute or apoplectiform. The gangrenous variety runs an acute course.

Suppurative pancreatitis may result in an evacuation of the abscesses into the stomach or duodenum; or they may open into the cavity of the great omentum, which, transformed into a large peritoneal abscess, may, in turn, open into the digestive tract. Pylephlebitis and abscesses of the liver may follow. Disseminated fat-necrosis is comparatively infrequent.

Hemorrhagic pancreatitis usually proves fatal in from two to four days. The gross lesions are then those of hemorrhage within and near the pancreas, extending into the subperitoneal fat-tissue, perhaps as far as the pelvis. Peripancreatitis may be expected, and disseminated fat-necrosis is common.

Gangrenous pancreatitis, although it may be secondary to a perforating inflammation of the gastro-intestinal or biliary tracts, usually results from a hemorrhagic pancreatitis, and proves fatal in the course of a few weeks. The gangrenous processes extend to the parapancreatic tissue, and produce more or less complete sequestration of the pancreas. The peritoneal wall of the omental cavity becomes inflamed, that covering the pancreas may be destroyed, and the sequestered gland may lie in the omental cavity, soaked in pus, and attached only by a few shreds. Both pus and pancreas may be discharged into the intestine. Splenic thrombophlebitis is not uncommon, but hepatic abscesses are rare. Disseminated fat-necrosis is frequent.

Symptoms.—The common symptoms of acute pancreatitis are sudden, severe, often intense, epigastric pain, without obvious cause, in most cases followed by nausea, vomiting, sensitiveness, and tympanitic swelling of the epigastrium. There is prostration, often extreme, frequent collapse, low fever, and a feeble pulse. Obstinate constipation for several days is the rule, but diarrhoea sometimes occurs. If the case does not end fatally in the course of a few days, recovery is possible, or a recurrence of the symptoms in a milder form takes place, and the characteristics of a subacute peritonitis are developed.

Diagnosis.—The symptoms are essentially those of a peritonitis beginning in the epigastrium and occurring suddenly, during ordinary health, without obvious cause. The diagnosis, therefore, is based on pain, tenderness, and tympany limited to the region of the pancreas, and

on the gradual development of a deep-seated peritonitis in the same place.

Differential Diagnosis.—The differential diagnosis lies, practically, between an irritant poison, perforation of the digestive or biliary tract, and acute intestinal obstruction. An irritant poison is excluded by the history of the case and by the examination of the vomit.

Perforating ulcer of the stomach or duodenum is to be excluded by the absence of pain after eating, hemorrhages from the digestive canal, and cachexia. Acute perforation of the transverse colon is rare, and the resulting peritonitis progresses more rapidly, and is likely to be general. Perforation from gall-stones is usually preceded by attacks of biliary colic and jaundice, while the seat of the pain is rather in the region of the gall-bladder than in that of the pancreas.

Acute intestinal obstruction is most likely to give rise to doubt. It is to be eliminated by determining, through injection, the patency and capacity of the large intestine, by the rarity in the epigastrium, of an obstructed small intestine, by the immediate presence of localized tenderness, and by the usual absence of a conspicuous general tympany or limited distention of intestinal coils.

Treatment.—It is evident that all treatment, at the outset, can be nothing but palliative. With the formation of pus in the omental cavity comes the opportunity for the surgeon. The possibility of the successful removal of the gangrenous pancreas is suggested by the healthy condition of a patient seventeen years after he had discharged this organ from his bowels.

An unexpectedly early verification of the above conclusions has occurred within the week following the delivery of this lecture.

The case was that of a well-known gentleman of Boston, and presented so fully the symptoms above mentioned, that, when called, as consultant, I was able to make a diagnosis of acute pancreatitis, which was eventually substantiated.

The following is a brief summary of the essential features of this case, which will, hereafter, be more fully reported :

The patient was suddenly seized, February 19th, while apparently in his usual good health, with a severe pain and tenderness a short distance above and to the left of the navel. This was followed by vomiting and a certain degree of prostration. The administration of nearly a grain of morphia gave relief. I saw him in the evening, and during the subsequent two days of his life. He died on the third day. The localized pain was more or less

constant, with occasional severe twinges, and was also to be elicited by intercostal pressure in the splenic region. The sensation of a constricting band in the epigastric region was likewise mentioned. At the close of the second day the lower abdomen became sensitive in spots. There was vomiting on the first day, but not later, and the bowels were confined. The abdomen was somewhat distended and dull, except in the epigastrium. The pulse was moderately accelerated, and the temperature slightly elevated.

The diagnosis lay between acute mechanical intestinal obstruction, perforative peritonitis, and acute pancreatitis. The majority of the consultants agreed to the first as the most probable condition, and advised a laparotomy, which was performed on the third day. Spots of fat necrosis were seen in the omentum, but there was no evidence of mechanical obstruction.

At the post-mortem examination the characteristic appearances of hemorrhagic pancreatitis were found, also numerous spots of disseminated fat-necrosis.



PROCEEDINGS
OF THE
NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, January 23, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. H. J. BOLDT presented some specimens of

CYSTIC OVARIES

illustrating the difficulty sometimes encountered in the diagnosis of ovarian tumors. The patient was thirty-nine years of age, and had been married twenty-one years. She had had two children, the last one having been born eighteen years ago, and one miscarriage five years ago. During the past six months she had been ailing, complaining of a pain in the right inguinal region, and losing flesh. She was cachectic-looking, her muscles were soft and flabby, and the abdomen was somewhat distended by ascites. On the left side there could be felt a tumor which seemed to be about the size of an infant's head, lying to the left of the median line and a little above the umbilicus. The tumor was smooth and movable. On the right side, in the hypogastrium, a number of nodular masses were to be felt which were continuous with other nodules extending into the right inguinal region. The uterus was displaced upward by a mass in the cul-de-sac. The tumor on the left side was taken to be a solid tumor of the ovary, and that on the right side to be a malignant growth. The patient was constipated, and when the bowels did move nothing was passed but scybalæ.

On making an incision through the abdominal wall a mass appeared at the opening which presented all the appearances of a papilloma. The incision was carried up in order to ascertain what was the nature of the tumor on the right side, and it was then found to be an ovarian cyst. The tumor on the left side was also seen to be of the same nature.

\ The history of this case showed, Dr. Boldt said, that

one cannot be too careful in making a diagnosis in cases of abdominal tumor, for had he adhered to his first opinion that the case was one of cancer the patient would have been allowed to go unrelieved. The papillomatous growth which had appeared at the wound was found to be attached to the cyst of the right ovary. This was referred to the Committee on Microscopy for examination.

DR. ELIZABETH M. CUSHIER presented some specimens showing

FIBRO-SARCOMATA OF THE UTERUS AND LIVER,

removed post mortem from a woman, fifty-two years of age. The patient, a native of Ireland, had been married twenty-six years, and had had eleven children and two miscarriages, these last occurring in the same year, twelve years ago. Since that time she had not been pregnant. Her family history was negative. Menstruation had always been regular, profuse, from five to seven days in duration, painless, and recurring every three weeks. One year ago the patient had a severe uterine hemorrhage, after which the flow became excessive, and three months later ceased. The month following this the patient began to be troubled with nausea and vomiting, and since that time had been able to take only liquid food. Six months ago she first noticed a swelling of the abdomen, beginning in the epigastric region and extending downward and to the left. She had had very severe pain in the epigastric and hypochondriac regions, dating from about the same time. She was admitted to the Infirmary of the Woman's Medical College on December 26, 1888. She was at that time greatly emaciated, jaundiced, with dry and coated tongue, and greatly distended abdomen. On palpation in the epigastric region a large, hard mass could be felt extending downward half way to the umbilicus, and continuous with a mass in the left hypochondrium, which reached four inches below the ribs. There was dulness over this entire region, and dulness also in both flanks. The uterus could be felt as a firm uniform tumor reaching half-way to the umbilicus. The circumference of the abdomen at the umbilicus was $38\frac{3}{4}$ inches. Urine high colored and scanty, and contained $\frac{1}{6}$ albumen.

The condition of the patient did not materially change while she was under observation, excepting that there was a perceptible increase of the abdominal tumor. She took but little nourishment, and complained constantly of pain when not under the influence of morphine. The sensorium was unaffected, and the patient greatly desired an operation, hoping to gain relief, but it was decided that nothing could be done.

The woman's strength gradually failed, and she died

on January 18, 1889. At the autopsy, made eight hours after death, many recent adhesions were found between the visceral and parietal peritoneum. The liver was enormously enlarged, and studded with soft, irregular, yellowish nodules, an aggregation of the latter at the lower portion of the left lobe forming a mass the size of a small foetal head. The liver was adherent to the diaphragm, and to all surrounding viscera. The stomach, which was firmly adherent to the liver, had been so displaced that it occupied a vertical position to the left of the median line. The transverse colon and small intestines were adherent to each other, and to the lower and posterior surfaces of the liver. The spleen was adherent, otherwise normal. The kidneys were slightly enlarged and soft, capsule free, and presented no nodules. The heart was normal. The lungs were compressed by encroachment of the tumor, and congested posteriorly, otherwise normal. The uterus was the size of the gravid organ at four and a-half months. Its walls were uniformly enlarged excepting at one point on the right side where there were three soft nodules about the size of a hickory nut. The glands were nowhere involved. Upon section of the liver it was found studded with nodules, varying in size from a pin's-head to a hickory nut. The central portion of the left lobe was almost wholly converted into a soft nodular mass. Elsewhere the nodules were distinctly circumscribed, and limited by liver tissue, which was apparently unaffected by the neoplasm. The liver weighed sixteen pounds. The uterus, upon section, presented the firm, white fibrous structure characteristic of uterine fibromata. The nodules were, however, much softer than the surrounding structure. The mucosa was intact.

Microscopic examination of the nodules of both the liver and uterus gave the characteristic spindle-cells, with large, clear nuclei, of fibro-sarcoma. So completely were the tissue elements of both organs replaced by the cells of the neoplasms, that it would have been impossible to distinguish liver from uterine tissue in the sections under the microscope.

The points of interest were—first, the comparative rarity of sarcoma of the liver; second, the still greater rarity of the growth as a result of metastases from sarcoma of the uterus. In the literature on the subject, Dr. Cushing had not found any case in which the disease in the liver was secondary to a primary sarcoma of the uterus. That such cases do exist, and are reported, is more than probable, she said, but the difficulty in finding them points at least to their infrequency.

A question naturally arises as to whether certain cases which have been reported as primary sarcoma of the liver

may not have had their origin in an obscure sarcomatous nodule of the uterus, that favorite site of fibroid neoplasms which are so closely allied to sarcoma.

DR. BOLDT said that these metastases in the liver from sarcomata of the uterus were certainly very rare. He had never seen such a case.

DR. H. A. C. ANDERSON presented a specimen, showing

CONGENITAL OCCLUSION OF THE DUODENUM,

removed from the body of an infant. The child was born at eight and a half months, and was, to all appearances, perfectly healthy. It was soon noticed, however, that it could not swallow, and on the third day after birth it began to vomit a greenish-black fluid. The vomiting continued until the evening of the fourth day, when the child died. At the autopsy all the organs were found to be normal and well formed, except the duodenum. About one inch of this portion of the intestine, in close proximity to the pylorus, was absent, each end above and below the deficiency forming a perfect cul-de-sac. About one drachm of meconium was found in different parts of the small intestine, while about one ounce of it was in the stomach. The speaker was at a loss to explain the presence of the greater portion of the meconium in the stomach.

DR. HOLT asked whether the child's bowels had moved after birth.

THE PRESIDENT inquired in what portion of the intestine the bile-duct opened.

DR. ANDERSON said that the child's bowels had not moved. In the moment of surprise caused by the peculiar condition found, the position of the opening of the bile-duct had not been noted. He said that the occlusion was perfect, for the intestines had been injected, first with water and then with air, but there was no escape of either at the point of deficiency.

DR. FREEMAN said he had made some search into the literature of this subject, but had found no case similar to this. In looking for an explanation of the presence of the greater part of the meconium in the stomach, we must first consider what meconium consists of. It is made up of what is swallowed by the foetus, of the intestinal, and of the biliary secretions. There might have been a double bile-duct discharging both into the stomach and into the intestine. Or the bowels might have moved, and then the meconium have been swallowed.

DR. ANDERSON said that there had been no motion of the bowels before birth, for the amniotic fluid was perfectly clear.

THE PRESIDENT thought it most probable, as had been suggested by Dr. Freeman, that there were two bile-ducts, the larger one emptying into the cul-de-sac of the pylorus.

DR. B. FARQUHAR CURTIS gave a demonstration of Nothnagel's experiments in the

PRODUCTION OF INTUSSUSCEPTION

by an electrical stimulus applied directly to the intestinal walls.

The Society then went into executive session.

Stated Meeting, February 13, 1889.

W.M. P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. JOHN S. ELY presented the

REPORT OF THE COMMITTEE ON MICROSCOPY

on the specimen referred to the committee by Dr. Boldt on January 23d. The tumor presented the structure characteristic of the papillary form of cyst adenoma of the ovary.

DR. FREDERICK S. SELLEW presented a specimen showing

CROUPOUS COLITIS,

occurring in a child aged three and one-half years, who was suffering from pharyngeal diphtheria. The general condition of the child was poor, and she was suffering with whooping-cough when taken with diphtheria.

The membrane covered the surface of the tonsils and pharynx. There was no dyspnoea. The coughing was severe, and an extensive double pneumonia developed a few days before death, and was the cause of death. The child lived about ten days after the onset of the diphtheria, and during a greater portion of this time there was diarrhoea, more or less profuse, but there was no pain, no blood, and no tenesmus.

Autopsy.—The child was poorly nourished and emaciated. The tonsils were enlarged with dilated crypts containing grayish mucus and granular matter. Pseudo-membrane was present on the surface of the tonsils and on the pharynx. The larynx and trachea were normal. There was broncho-pneumonia at the base of both lungs posteriorly, and emphysema anteriorly. The bronchial glands were enlarged, but not cheesy. The stomach and small intestine were normal. To the mucous membrane of the colon, from the anus to the cæcum, there was adhering a flocculent pseudo-membrane, gradually decreasing in quantity from below upward. A croupous inflammation of entire colon existed. Sections of the intestines were examined microscopically by Dr. Northrup, and found to present the usual lesion of croupous inflammation. The spleen, kidneys, and liver were normal.

This case was of interest, Dr. Sellew said, on account of the infrequency of croupous inflammation of the intestines. Dr. Northrup had found the condition but once in over 1,500 autopsies. He had never found it occurring in the small intestines. Weissenfels and Freund have collected records of 103 cases, and in but four of these was the inflammation confined to the small intestine only. In a ré-

cent number of the *Medical News*, Dr. B. K. Rachford, of Cincinnati, explains the infrequency of intestinal diphtheria by the theory that the diphtheritic germ is dependent, to a great degree, upon oxygen for its existence. He believes that the presence of the diphtheritic exudate in the intestine is dependent upon some pathological condition of the intestinal tract which would furnish oxygen, either in the free state or in some unstable combination, which could be utilized by the germ for its growth. Such an unstable compound exists in the oxyhaemoglobin of the blood—the congested and eroded mucous membrane being the pathological condition which would bring the germ in contact with this body, from which it would derive its oxygen.

DR. L. EMMET HOLT asked whether it were necessary to regard the colitis as a diphtheritic affection. Might there not be a diphtheria of the larynx and pharynx with, at the same time, a non-specific croupous colitis, occurring coincidentally but independently of the former?

THE PRESIDENT said that in this case the local lesions in the pharynx, larynx, and colon resembled each other very closely, and though he was not prepared to assert positively that they were identical, yet he believed that they would prove so to be. He had seen a diphtheritic membrane in the stomach, but had never seen but one other instance of croupous colitis. He had had two cases of colitis occurring at the same time, both of which he supposed to be membranous; one of them, however, turned out to be a simple catarrhal inflammation.

DR. LOCKWOOD asked whether any bichloride of mercury had been used, either locally or internally, in the treatment of this case.

THE PRESIDENT replied that it had not. The throat symptoms, indeed, had been not at all pronounced. If it were true that the lesions of diphtheria were due to the presence of an aerobic micro organism, the occurrence of intestinal diphtheria might be explained by the entrance of the microbe through the anus, the lesions in such a case being most marked in the parts nearest the anus, and decreasing gradually in proportion to the distance from this point.

DR. R. G. FREEMAN presented a number of gross and microscopical specimens of

ECHINOCOCCUS CYSTS OF THE LIVER,

removed from the body of a Sicilian woman, forty-four years of age, resident three years in the United States, who died at Roosevelt Hospital, last January, with symptoms of cardiac and nephritic disease.

Autopsy.—There were evidences of pneumonia, heart

disease, mitral stenosis, congested spleen, chronic diffuse nephritis, and chronic gastritis. The liver was cirrhotic, and in it were two communicating spheroidal cysts. These cysts were close to the base of the gall-bladder, and at one point the larger cyst was separated from the anterior surface of the liver only by a connective-tissue membrane which presented the appearance of a cicatricial depression. The smaller one was more deeply seated. The diameter of the larger cyst was six centimetres; of the smaller, four and one half centimetres. They were filled with a pultaceous yellow material, which on gross examination showed larger and smaller translucent masses scattered through it. The translucent masses proved, on microscopic examination, to be the characteristic lamellated echinococcus cyst membrane. On examining the yellow material a few hooklets were found. There was much granular matter, some fat-globules, yellow and red pigmented particles, cholesterin crystals, and lime salts. The translucent masses were made up of two distinct

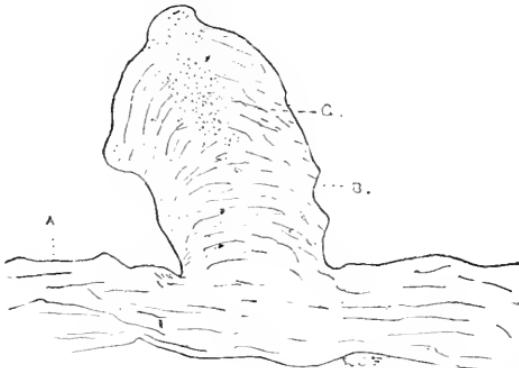


FIG. 1.—Section showing Rudimentary Brood Capsule Projecting from Mother Membrane. (Somewhat shrunk by salcohol.) A, Mother membrane; B, rudimentary brood capsule; C, calcareous degeneration.

sorts of membrane, both, however, exhibiting the characteristic lamellated structure: 1, pieces of thick membrane consisting of several layers, that on one surface being white, the other yellow; 2, complete daughter cysts. The thick pieces of membrane the speaker took to be portions of the mother-bladder; some pieces presented both surfaces plain, but in others there were numerous projections from the white surface which had the appearance of brood capsules. They were translucent, and conical in shape, and a thicker streak passed from the apex to the middle of the base (Fig. 1). On microscopic examination they appeared to be an outgrowth from the lamellated layer of the membrane, the lamellæ curving out as they reached this point; they contained no cavity; the darker

streak through the middle consisted of lime salts. These, then, if they were rudimentary brood capsules, were sterile and had undergone calcareous degeneration. Just such a structure as this, Dr. Freeman said, he had been unable to find described or illustrated, although sterile cysts are mentioned. The daughter cysts varied in diameter from fifty millimetres to four centimetres. Seventy-five daughter cysts were isolated, this being probably about two-thirds of the whole number present. Some of those examined were sterile; others contained scolices and hooklets. Some contained granddaughter cysts, and in one there was a granddaughter cyst which contained three great-granddaughter cysts. The scolices were found in all stages of degeneration, in the later stages nothing remaining but a pile of lime corpuscles and hooklets. Lining the cyst cavity outside of all was a dense connective-tissue membrane.

The cyst contents were preserved in a saturated aqueous solution of chloroform on the suggestion of Dr. Prudden. This chloroform water had proved a very good preserving fluid, no organism having grown in it, nor had it had any distorting influence on the specimens.

The speaker thought the specimens worthy of presentation, first on account of the very complete exhibition of the life-history of an echinococcus cyst which they afforded, and secondly on account of these peculiar papillary outgrowths.

The specimens presented were: 1, spleen; 2, liver with connective-tissue membrane; 3, membrane with papilla fresh; 4, membrane with papilla hardened, cut, and stained; 5, a cyst hardened, cut, and stained; 6, fresh cysts showing contents.

DR. H. P. LOOMIS presented

A LARYNX AND THREE LARGE PIECES OF MEAT,

illustrating one of the more rare causes of sudden death. A man, who was intoxicated, entered a restaurant, and began to eat, but suddenly choked and fell over dead. At the autopsy, made by Deputy Coroner Jenkins, three large pieces of meat were found in the throat, one of them completely occluding the glottis. In the records of the coroner's office are twenty-seven cases of sudden death from a foreign body in the larynx, in two only of which was food the occluding body.

DR. GEORGE R. LOCKWOOD presented two

URIC ACID CALCULI,

which had been passed by a gentleman, forty-four years of age, of good family and personal history. The details of his illness have been previously given (MEDICAL RECORD,

May 24, 1888) in a communication read before the Section in Practice of the New York Academy of Medicine. Briefly they are these: In 1872 the patient had an attack of renal colic on the right side, which passed away, leaving a sense of dull pain and soreness along the course of the ureter for one year. He had no return of the trouble until 1884, when he was taken with pain in the left side, followed by sharp uræmic convulsions and stupor. Recovered at the end of five days, convalescence being established by free diuresis. How much urine passed during this attack was not known. Recovered and remained well till December 27, 1887, though the urine always contained uric acid crystals. On the latter date he was suddenly seized with pain in the left side, and developed convulsions and stupor, the uræmic attack lasting only for several hours. During the first day he passed 12 ounces of urine, containing 46 grains of urea; second day, 18 ounces of urine, with 142 grains of urea; third day, 4½ ounces, with 35 grains of urea; fourth day, 4½ ounces, with 39½ grains of urea; fifth day, 4¾ ounces, with 48½ grains of urea; sixth day, 4¼ ounces, with 31 grains of urea. During this time a slight drowsiness was his only uræmic symptom. No tumor could be detected in the abdomen. On the seventh day he began to make water in large quantities, passing in twenty-four hours 299 ounces, or 18¾ pints, containing 2,401 grains of urea, and during next two days 68 ounces and 88 ounces, respectively. Then he had another attack of renal colic lasting for four hours, and followed by a diuresis of 188 ounces. Three weeks afterward he passed these two uric acid calculi. From this time on his urine became normal. He remained a comparatively well man until, toward the close of September, 1888, he was suddenly seized with convulsions, became comatose, and died.

Autopsy.—The following is the record of the autopsy, which was made by Dr. Ferguson: "Inspection, no œdema; peritoneum normal; pleura, old adhesions both sides; heart normal in size, valves competent, muscular tissue contains small amount of fat; lungs hyperæmic and moderately œdematosus in most dependent parts; spleen bound by tough fibrous adhesions to neighboring parts, normal in size, capsule thickened.

"Left kidney is large and lobulated, surface smooth, capsule not adherent. The entire organ swollen and congested. Markings not distinct. Cortex unusually thick. There are small calculi embedded in the substance of the organ, in both the medulla and cortex. Ureter is normal. Microscopic examination shows considerable fibrous tissue in excess of normal, but the most prominent changes are in the parenchyma. Many of the Mal-

pighian tufts are converted into fibrous tissue, many of them converted into fat. The tubules of both the cortex and pyramid, but especially of the cortex, are far advanced in fatty degeneration. Many of these tubes, not yet in the state of fatty degeneration, show their epithelium to be very granular. There are numerous masses of urates in the cortex and pyramids which require the microscope to bring them into view. The straight tubes contain both granular and hyaline casts.

"The location of the right kidney is occupied by a cyst, which is the pelvis of the kidney, limited by a thin rind of cortex less than one-eighth inch in thickness. At a distance of less than one inch from the pelvis the ureter is completely blocked by a calculus one-half by one-fourth inch in size. The ureter below the obstruction is thickened, its lumen small, the mucous lining cicatricial. The microscope can hardly distinguish a trace of kidney-tissue in the thin rind of cortex which makes up the wall of the greatly dilated pelvis, which has a capacity of four and one-half ounces. Liver large and fatty; stomach and pancreas normal; adrenals, cortices fatty, the fat being distributed in circumscribed masses which stand out in marked contrast to the healthy portion of the organ; bladder, mucous membrane lined by fine calculi, otherwise normal; brain, convolutions over cortex slightly atrophied, brain moderately congested."

There are four points of interest, Dr. Lockwood said, about the case :

"1. Anuria following impaction of a renal calculus, if lasting more than a few hours, signifies destruction of the kidney. The other kidney may be congenitally absent, but, as a rule, it is atrophied by occlusion of its ureter by a previously impacted calculus. We cannot understand a simple inhibitory reflex lasting so long.

"2. Anuria induced in this way is, as a rule, accompanied by slight uræmic symptoms. This is of importance in differentiating obstructive from non-obstructive anuria.

"3. The case throws light upon the origin of hydro nephrosis. Many of the text-books make the assertion that a hydro-nephrosis is due to a sudden and complete stoppage of the ureter : The kidney is secreting urine, the ureter becomes blocked, the urine still continuing to be secreted, dilates the pelvis of the kidney. That this statement is erroneous I think can be proved by the following facts : *a.* When the ureter is submitted to a back pressure of 2.4 inches of mercury this pressure equalizes the blood-pressure in the Malpighian tuft and further secretion is stopped. This pressure is exerted in a healthy kidney by 3 ij.-iv. of urine. *b.* The pelvis and ureter are not to be distended easily. The ureter will stand a pressure of five feet of mercury. Only

one-half ounce of fluid can be injected into the cut ureter and pelvis, any extra force used only drives the surplus out through the renal vein. *c.* As regards autopsies, this case is the only one to my knowledge in which an autopsy has been made after the dislodgement of a calculus that had produced such an anuria. It is valuable, then, for this. The left pelvis and ureter were normal. A number of autopsies have been recorded where a calculus remained impacted. In these the kidney was atrophied, and the pelvis contained only an ounce or so of fluid.

"4. The diuresis, then, must have been due (*a*) to the diuretic effects of retained urea; (*b*) to a vaso motor dilatation of the renal vessels, following the withdrawal of back pressure when the calculus became dislodged, without compensating vaso-motor dilatation elsewhere."

DR. L. EMMET HOLT presented a larynx showing

ULCERATION OF THE VOCAL CORDS FOLLOWING AN ATTACK OF MEASLES.

The patient was admitted to the Randall's Island Hospital in June in wretched condition, at that time one year of age. She gained in weight and improved steadily until she took measles, January 5th. The rash came out well and the constitutional symptoms were of only average severity. She did well until January 17th, when hoarseness, nasal discharge, and a rise of temperature led to the suspicion of diphtheria, although no membrane was visible anywhere. From this time until death, which occurred January 25th, she had loss of voice, considerable laryngeal dyspnoea, and, in fact, all the usual symptoms of membranous laryngitis. She was not operated upon, although the dyspnoea was so severe that it was contemplated several times. She emaciated steadily and died of exhaustion apparently. Throughout the last week of the illness there was considerable choking whenever the attempt to swallow fluids was made.

Autopsy.—Brain not examined. Larynx: The vocal cords were completely destroyed by ulceration, which extended upward to the ventricles of the larynx and downward for nearly one-fourth of an inch. The ulcer went apparently down to the cartilages. Its surface was covered with a ragged mass of necrotic tissue. It had all the appearances of being of recent formation. The larynx otherwise showed no noteworthy change. No false membrane in larynx, trachea, or bronchi. Lungs: The right contained several old, cheesy nodules, the largest being the size of a walnut. Nothing recent in either lung, and no pleurisy.

There was nothing of interest or importance seen in liver, spleen, kidneys, stomach, or intestines.

Dr. Holt also presented a specimen of

CYSTIC DEGENERATION OF THE KIDNEY.

The patient was a female in middle life who died of chronic suppurative peritonitis, having been under operation only a few hours before death. The right kidney was enlarged—weight, five ounces—and presented the usual appearances of chronic diffuse nephritis, quite well marked; the capsule was adherent, the surface granular, and the cortex a mottled yellowish-white color. The right kidney weighed one ounce; it was made up of cysts, the largest of which were about three-quarters of an inch in diameter. It was enveloped in fat, and on section very little renal tissue was seen. Dr. Holt had not made the autopsy, but in the specimen as shown there had been found no ureter. The heart was also shown. It exhibited the lesions of well-marked mitral stenosis, the orifice not admitting one finger.

DR. BIGGS did not think that the specimen was one of congenital cystic kidney. He asked if the speaker had ever seen any other congenital cystic kidney of such small size.

DR. HOLT said that he had presented one to the Society some time ago weighing only about half an ounce. He had also seen another one that was very small. He had supposed that this one was congenital from the fact that no trace of a ureter could be found.

THE PRESIDENT had seen several cases of ulceration of the vocal cords in children, but had never been able to account for them satisfactorily. He believed that Dr. Holt's case was one of diphtheritic ulceration.

DR. H. M. BIGGS presented some specimens illustrating

TUBERCULOSIS OF THE FEMALE GENITAL ORGANS.

The subject was a woman, fifty-seven years of age, who had died in Charity Hospital a short time after admission. The abdomen was noticed to be slightly distended, and the patient had had an irregular temperature, reaching at one time 101.5° F. The clinical history was otherwise incomplete. At the autopsy, evidences were found of recent tubercular peritonitis with little or no exudation. In the lungs scattered tubercles were seen, and at the apex of one lung was a rather large cheesy nodule. The uterus was somewhat distended, and, on being cut into, was found to be filled with caseous matter. Both Fallopian tubes were dilated, the dilatations being nodular. A cheesy mass was also found in the right ovary. Tuber-

cle bacilli were present in large numbers in this caseous material.

These cases of tubercular disease of the female genital organs, the speaker said, do not seem to be recognized, in this country at least. There should not, however, be the slightest difficulty in making a diagnosis, for the discharge contains bacilli in great numbers. The disease, furthermore, could not be so very rare, for he had seen four cases within the past year. In three of these cases the process seemed to be older in the genital organs than anywhere else.

A second specimen was one of

GUMMY TUMORS OF THE BRAIN,

illustrating the symmetry of the lesions of syphilis in this organ. The patient presented symptoms of tertiary syphilis, and some months before death he developed ophthalmic paraplegia—double ptosis. As a result, probably, of this, he fell while going down-stairs, and broke his skull, death resulting. At the autopsy a gummy tumor was found on each third nerve, and there was also a slight thickening about the infundibulum and about the fissure of Sylvius on each side.

Dr. Biggs also presented a third specimen, showing

IMPACTION OF A GALL-STONE IN THE CYSTIC DUCT,

completely obliterating the duct. Afterward the fluid contents of the gall-bladder had been absorbed, and the bladder-walls had contracted down, closely embracing the contained calculus. There had been no symptoms occasioned by this condition; none, at least, during the time that the patient had been under observation. Death resulted from the rupture of an abdominal aneurism.

DR. W. P. NORTHRUP presented the

GIZZARD OF A FOWL IN WHICH WERE THREE PINS.

The pins were found when the chicken was being dressed for the table. They were very firmly embedded in the walls of the gizzard, and could not be pulled out with the unaided fingers.

The Socieiy then went into executive session.

Stated Meeting, February 27, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. GEORGE C. FREEBORN presented some specimens showing

CARCINOMA OF THE CERVIX UTERI, FIBROMA OF THE UTERUS,
AND OCCLUSION OF THE LEFT URETER BY A CARCINOMATOUS MASS.

The patient, a woman, about thirty years of age, was attacked, shortly after her admission to the New York Cancer Hospital, with severe vomiting. Soon after that she had a severe convulsion. Alternating attacks of vomiting and convulsions continued for three days. The patient finally died in a convulsion. The examination of the urine during this time was negative.

Autopsy.—The brain was slightly edematous, but otherwise normal. The thorax was not examined. The stomach, liver, spleen, and intestines were normal. The right kidney was slightly enlarged, and showed the gross lesions of chronic diffuse nephritis. The left kidney was about normal in size, and showed the same lesions as the right. Its pelvis was dilated to twice the normal size. The left ureter was dilated throughout its entire course to the base of the bladder, where it was lost in a mass of carcinomatous tissue. It measured 1 ctm. in diameter, and was filled with urine. The uterus was enlarged, measuring 12 ctm. in length, and 8 ctm. across the horns. The ovaries were slightly enlarged, cystic, and bound down to the uterus by adhesions.

Upon making an antero-posterior section through the uterus and upper part of the vagina, it was found that the cervix uteri was almost completely destroyed. The posterior wall of the vagina was infiltrated with a dense, diffuse mass. A portion of this mass extended into the wall of the bladder, in the shape of a conical projection, measuring $1\frac{1}{2}$ ctm. in height, and 2 by 3 ctm. at its base. The apex of this mass pressed upon the left ureter, completely occluding its lumen as it passed into the bladder. The mucous membrane of the bladder over this mass appeared normal.

At the fundus of the uterus, attached to the left wall, and filling up the entire cavity, was an oval mass. On section the mass measured 4 by $4\frac{1}{2}$ ctm. It had a white, glistening appearance and was quite hard.

Microscopical examination.—Sections from the cervix uteri and from the mass infiltrating the vaginal wall

showed the growth to be carcinoma of the epitheliomatous type. Sections from the uterine tumor showed it to be a fibroma.

DR. EUGENE HODENPYL presented some specimens showing

INFLAMMATION AND GANGRENE OF THE VERMIFORM APPENDIX.

According to the patient's own account he had been in perfect health up to four days before his admission to the hospital. He then began to complain of pain in the right inguinal region, and presented other symptoms of perityphlitis. Examination revealed the presence of pus in the right iliac fossa, and a small incision, two and a half inches long, was made to give exit to it. The patient was, however, not relieved, and died shortly afterward.

At the autopsy the lungs were seen to be intensely congested. The abdominal cavity contained about two quarts of pus, and the intestines were more or less covered by adhesions. The vermiform appendix was distended, and in a condition of commencing gangrene. The pus surrounding the appendix had burrowed up behind and around the right kidney, and its effects were shown by a necrotic condition of the fat. The left kidney presented the lesions of parenchymatous nephritis. The specimens showed these lesions, and also a part of the abdominal wall, in which the incision was made down to the seat of disease.

In reply to a question as to the length of time that the disease had existed, Dr. Hodenpyl said that, according to the patient's statement, it was only four days, but he thought the time must have been longer than this.

DR. LEWIS HALL SAYRE presented a

TUMOR OF THE BREAST,

together with an enlarged axillary gland, removed from a negro woman about sixty-five years of age. Some five or six years ago the patient had first noticed a slight swelling in the left breast, accompanied by lancinating pains, and this had continued to grow slowly. She was a washer-woman, and had followed this occupation up to the day before the operation was performed. The breast was removed by an elliptical incision, the only thing worthy of remark about the operation being the difficulty experienced in bringing together the edges of the wound by reason of the large amount of tissue that had to be removed. The only gland that appeared to be affected was one in the lower part of the axillary region, well under the pectoralis major muscle. This was removed, and was shown with the breast. The tumor was apparently a

carcinoma, and Dr. Sayre asked that it be referred to the Committee on Microscopy for examination.

DR. WILLIAM P. NORTHRUP presented some specimens, removed from a child aged five weeks, showing the

ARREST OF DEVELOPMENT OF ONE KIDNEY.

The specimen showed the mere rudiments of the left ureter, at the extremity of which was a bulbous tip, 1 ctm. long by 2 mm. in breadth, representing the undeveloped kidney. The speaker had previously presented two cases of displacement downward of the kidney, and in each case, as in this, it was the left kidney that was concerned. In both these cases the suprarenal bodies were in their normal position. The child from whom this specimen was removed had presented no symptoms directing attention to the kidneys. The ureter had evidently not increased in length for some time, though there had been some enlargement of its calibre. The rudiment of the kidney was lying on the left common iliac artery at the level of the last lumbar vertebra.

DR. MESSENGER asked whether there was any arterial supply to the rudimentary kidney.

DR. NORTHRUP had been unable to discover any vessels, even rudimentary ones.

DR. J. C. PETERS said that one of the first specimens examined microscopically in this Society was one similar to this, and he thought it would be interesting to compare the results of an examination in the present instance with what was observed in the other.

The Society then went into executive session.

Stated Meeting, March 13, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE
CHAIR.

REPORT OF THE COMMITTEE ON MICROSCOPY.

DRS. IRA VAN GIESON and JOHN S. ELY reported that the tumor of the breast referred to the committee on February 20th, by Dr. L. H. Sayre, had the morphological structure of fibro-carcinoma, or the scirrhouss variety of carcinoma.

DR. JOHN S. ELY presented a specimen showing

PRIMARY CARCINOMA OF THE COMMON BILE-DUCT,

with the following remarks :

"Primary tumors of the biliary passages outside the liver, of whatever nature, are of great rarity. Two or three fibromata, a papillary myxoma, and sarcomatous infiltration of the wall of the gall-bladder have been described, but by far the commonest form of tumor of these parts is carcinoma.

"It is customary to consider separately carcinoma of the gall-bladder and of the ducts. This distinction appears to me to be properly made, since the clinical history in the two cases is essentially different, carcinoma of the biliary ducts being almost invariably accompanied by intense jaundice, while carcinoma of the gall-bladder alone never is.

"There is a considerable number of cases of so-called primary carcinoma of the gall-duct on record, but in most of these the presence of nodules of cancer in adjacent organs destroys the proof regarding the point of origin of the new growth. I have succeeded in collecting seven cases, however, in which there could be no question as to the origin of the tumor in the gall-ducts, no other growth of any kind occurring in any of these cases. These cases are reported by Durand-Fardel,¹ Rosenstein,² Schreiber,³

¹ Durand-Fardel : Recherches anatomico-pathologiques sur la Vésicule et les Canaux biliaires, Archives gén. de Méd., 1840, p. 167; also, 1841, p. 418.

² Rosenstein, S.: Icterus durch Cancroid des Ductus choledochus mit Albuminurie, Berl. klin. Wochenschr., i. (1864), No. 34, p. 336.

³ Schreiber, J.: Ueber das Vorkommen von Primären Carcinomen in den Gallenwegen, Berl. klin. Wochenschr., xiv. (1877), No. 31, p. 446.

Korezynski,¹ Schüppel,² Key,³ and Kraus.⁴ Five of the patients were men; two, women. Four were more than sixty years of age; two (Key, thirty-five, and Kraus, forty-nine) were younger; of one (Rosenstein) the age is not given. In all cases except one (Durand-Fardel) symptoms distinctly referable to the tumor were present, and they are of great uniformity.⁵ There was gradually developed jaundice, which toward the last became very intense and presented all the characteristics of jaundice due to obstruction. Pain was not a marked symptom, but is mentioned as having been present in slight degree in four of the cases. The duration of the symptoms appears to have been from eight weeks to about eighteen months. The tumor in all cases was very small. In three it was situated at the mouth of the common bile-duct; in four it was in the wall of the hepatic duct. A more or less careful microscopical examination, in most of the cases, confirmed the diagnosis of carcinoma. In all the cases there was narrowing of the lumen of the gall-duct at the site of the tumor, but there was complete occlusion of it in only one, that of Kraus, in which there was a large impacted gall-stone. The biliary passages above the tumor were markedly dilated in every case, and contained liquid variously described as brownish, dirty gray, clear and slightly greenish, etc. The liver is stated to have been enlarged in four cases, and not enlarged in one; it was soft, owing to great dilatation of the bile-ducts, in three cases; firm and hard in two; in all except one (Durand-Fardel) it was deeply stained with bile. The fact that five of the seven patients died of some intercurrent disease a comparatively short time after the onset of symptoms of obstructive jaundice renders it probable that in these cases we have to do with very early stages of what would later have become more widely diffused growths involving neighboring organs. It is consequently reasonable to suppose that many of the diffused growths in the neighborhood of the gall-ducts have their starting-point in the walls of the latter.

"Through the kindness of Dr. Hartley, in whose ward the patient died, I am able to present to you this evening a specimen of this very early stage of carcinoma of the common gall-duct. The patient was a German, fifty-

¹ Korezynski: Primär Carcinom im Ductus hepaticus. Review in Virchow-Hirsch Jahresbericht, 1878, ii., p. 208.

² Schüppel, O.: V. Ziemssen's Handbuch, viii., 1 (1880), pp. 66-76.

³ Key: Fall af primær Kanceri gälgångarna. Review in Virchow-Hirsch Jahresbericht, 1881, ii., p. 190.

⁴ Kraus, J.: Ein Fall von primären Krebs des Ductus choledochus in Folge eines im letzteren eingekeilten Gallensteines, Prager med. Wochenschr., ix. (1884), No. 49, p. 483.

⁵ Durand-Fardel's patient was an old woman, eighty-one years of age, who apparently died of senility, the tumor having given no symptoms whatever.

three years of age, a tailor. He was admitted to Bellevue Hospital on February 11, 1889, and gave the following history. Four years previously, had an attack of jaundice of short duration, from which he recovered. Present illness began four months before, when he began to be again jaundiced, but this time instead of disappearing it steadily increased in intensity. He complained of headache, loss of flesh, pain and tenderness over the liver. No vomiting, appetite good, bowels costive. Was confined to bed four weeks prior to admission. Examination showed patient to be intensely jaundiced. Tongue coated. Nothing abnormal discovered, except decided enlargement of the liver and distention of the gall-bladder, the outlines of which could be distinctly appreciated by palpation. Urine was olive green, 1.012, acid; contained a trace of albumen and a few granular casts. There was slight fever on admission (100.5° F.) and this continued, the temperature ranging between 99° and 102° F. On February 16th he was transferred to the surgical division, and five days later Dr. Hartley performed the preliminary operation for cholecystotomy. Thirty-six hours later parenchymatous hemorrhage developed, which baffled all attempts to check it, and on February 26th the patient died of exhaustion.

"*Autopsy*, eighteen hours after death. Dressings soaked with blood and about an ounce and a half of blood in abdominal cavity. Slight amount of pus at lower end of wound. No peritonitis.

"Liver much enlarged, soft, olive-green color; surface shows occasional white spots and streaks, apparently dilated bile-ducts just under the capsule. Gall-bladder and ducts very much dilated; contain whitish liquid resembling thin pus. At the mouth of the common duct there is a small nodular tumor, completely surrounding the duct and narrowing its lumen so that it is impervious to the liquid contents of the duct. The tumor is thicker in the lower and left walls of the duct, where there is a nodule measuring 11 mm. by 9 mm. The duct just above this nodule is dilated to a small pouch.

"There is no ulceration of the mucous membrane lining the duct. The cut surface of the tumor presents the appearances of carcinoma. Surrounding organs apparently not involved. Cut surface of liver shows markedly dilated bile-ducts, the walls of which appear to be very much thickened, and from which thin whitish liquid exudes; centres of lobules somewhat dark, peripheries light. Softness of liver apparently due to the great dilatation of the bile ducts.

"Pancreas somewhat hard, but no apparent lesion. Kidneys show lesions of chronic diffuse nephritis. Mesenteric glands enlarged, but no lesion evident. Stomach,

intestine, and rectum normal; spleen normal; brain and thoracic contents not examined.

"Microscopical examination shows the tumor to be cylindrical-celled carcinoma; the alveoli are very thick-walled. Sections of the liver show pigmentation of the cells and dilatation of the terminal bile-ducts, the walls of which, and of the larger ducts, are much thickened and infiltrated with small round-cells. The epithelium lining the bile-ducts is, in most places, gone or breaking down. Many of the bile-ducts are completely occluded by the products of inflammation. There is also a little interstitial hepatitis, besides dilatation of the central vein and fatty degeneration of the liver-cells. The pancreas shows the lesions of interstitial pancreatitis, besides, in places, evidence of recent inflammation; no sign of carcinoma discovered. Mesenteric glands show only ordinary hyperplasia. Kidneys show the characteristic changes of chronic diffuse nephritis.

"This case may, then, be epitomized as one of primary carcinoma of the common bile-duct, causing obstruction to the flow of bile, general dilatation of the biliary passages and gall-bladder, jaundice, and secondary inflammation of the bile-ducts. The other lesions found were insignificant.

"It is hoped that in the discussion of this case some light may be thrown upon the interesting question of the etiology of primary carcinoma of the liver. Importance is given to this subject, when it is appreciated that the liver is fourth upon the list, as regards frequency, of the organs affected with cancer. To be sure, the large majority of these are secondary to new growths in other parts of the body; still, a considerable number of them cannot be shown to be so, and we are compelled to suppose them primary in the liver.

"The laws of evolution render it impossible to believe that a highly differentiated cell can change into one of entirely different character, and we are, therefore, compelled to believe carcinomata to originate from epithelial structures. In the liver two such epithelial structures are present, the liver-cells and the epithelium lining the bile-ducts. We must look to one or both of these, then, for the source of primary carcinomata in the liver. Formerly the liver-cell was thought to be to blame in nearly all cases, but latterly the epithelium of the bile-ducts has come to be looked upon as the more common source of the neoplasm. This latter view is strengthened by our knowledge of the development of the liver, if we believe, with Cohnheim,¹ in the origin of tumors from embryonic

¹ Cohnheim: *Vorlesungen ueber allgemeine Pathologie.* 2 Aufl. Leipzig, 1882, i., p. 723.

cells arrested in development, for all the epithelial structures of the liver have a common source—the epithelium of the embryonic bile-ducts. If we suppose some of these cells to be hindered in their evolution and to remain for a time inactive, later to take on an abnormal activity, we have at least a plausible explanation of the origin of primary carcinoma of the liver from the bile-ducts. The careful study of cases of primary cancer of the liver by Naunyn,¹ Waldeyer² and Weigert,³ has lent much weight to this theory, almost amounting to proof. The case presented this evening, as well as the seven collected from the literature, seem to me to add evidence in favor of this idea, since they prove indisputably that carcinoma may originate from the gall-ducts outside the liver; and if this is possible outside the liver, why not equally well within it?"

DR. IRA VAN GIESON presented specimens illustrating
PRIMARY CARCINOMA OF THE COMMON GALL-DUCT, EN-
CROACHING ON THE PYLORUS AND LIVER.

"The specimen was taken from a woman, fifty years of age, who for twenty years had had fits of vomiting with intense epigastric pain. She was in the hospital but three weeks, and died deeply jaundiced, with symptoms of peritonitis.

"At the autopsy the wall of the common bile-duct was found to be uniformly thickened by a zone of rather dense white tissue, which also involved slightly the surrounding connective tissue, and a contiguous portion of the musculosa of the duodenum and pylorus. The latter contained in its musculosa a dense white nodule, 2 ctm. in diameter, which was not directly connected with the thickened duct. The thickened duct at its bifurcation into the hepatic ducts measured about two centimetres. Each of the hepatic ducts was about one and one-fourth centimetre in diameter. The thickening disappeared as the common duct entered the duodenum. Just before entering the liver each hepatic duct was adherent to the organ by a dense whitish zone growing into the liver. The enlarged and somewhat thickened gall-bladder contained about thirty variously sized, smooth, white-faceted gall-stones, and was adherent to the liver. Just above the gall-bladder the right lobe contained a hard, white nodule, 3 ctm. in diameter, not connected with the tubular mass surrounding the common duct and its branches. The liver

¹ Naunyn, B.: Ueber die Entwicklung der Leberkrebsen, Reichert u. DuBois-Raymond's Archiv, 1866, p. 717.

² Waldeyer: Die Entwicklung der Carcinome, Virchow's Archiv, Iv. (1872), p. 67.

³ Weigert, C.: Ueber primäres Lebercarcinom, Virchow's Archiv, Ixvii. (1876), p. 500.

also contained a number of rather small, scattered pus-cavities, the result of a suppurative inflammation about the gall-ducts. The intestines were loosely matted together and the abdominal cavity contained serum and flocculi of fibrin. There was nothing noteworthy about the other organs except that the kidneys were bile-stained.

"*Microscopical Examination.*—A large portion of the mass surrounding the gall-duct and its branches was composed of richly cellular connective tissue, in which were rather large acini lined with cylindrical epithelium. The nodules in the pylorus and in the liver were similar in structure. The pancreas and its duct were normal.

"Anatomical diagnosis was glandular carcinoma, primary in the gall-duct, and spreading thence to the liver and pylorus."

DR. G. C. FREEBORN presented a specimen illustrating
CARCINOMA OF BILE-DUCT AND PANCREAS, WITH CYST OF
THE HEAD OF THE PANCREAS.

"The patient, a female, aged fifty-five, was admitted into the New York Cancer Hospital in September, 1888. Her history, taken from the records of the hospital, is as follows: She has always taken alcohol in moderate quantities and for the past three years has had considerable pain in the gastric region and attacks of vomiting, especially after eating. The heart-sounds were rapid, but no murmur was detected over the apex; a soft blowing murmur was detected over the pulmonary artery. At the junction of the epigastric with the right hypogastric regions, and at the lower part of the epigastric and umbilical regions, there is a mass approximating the size of an adult fist. This mass extends more below the umbilicus than above, and elevates the region about half an inch above the surface. It is hard to the touch and is immovable. Deep pressure causes no pain. The pulse is 106° F. The tongue is reddened. The patient is very anaemic. The stomach was washed out some fifteen times and no traces of hydrochloric acid were found.

"On November 18th a diarrhoea set in which was hard to control. From this time the patient grew weaker, and died in the first week of January. The clinical diagnosis of carcinoma of the stomach was made.

"*Autopsy.*—The right lung was normal; the left was œdematosus and adherent at its apex. The heart showed some fatty degeneration of the muscle. The capsule of the left kidney was adherent and the cortical substance thickened; the right kidney was small but presented no marked lesions. The liver and spleen were normal.

"There were a few scattered ulcers in the rectum and descending colon. The head of the pancreas was embedded in a dense mass of tissue. The pyloric end of the stomach, as well as the descending and transverse portions of the duodenum, were adherent to this mass. Upon cutting into the mass a cyst which occupied the head of the pancreas was opened into, and found empty. In the anterior wall of the cyst two openings were found, one of which communicated with the ascending portion of the duodenum, the other with the transverse portion. The superior and anterior surface of the cyst was also adherent to the abdominal wall. The cavity of the cyst was irregular in shape and seemed to be limited to the head of the pancreas. No trace of the common duct could be found. The stomach was normal.

Microscopical Examination.—The tail of the pancreas was normal. The walls of the cyst, except the anterior, were found to be made up of carcinoma with a small amount of pancreas tissue. The anterior wall was found to be made up of intestinal tissue infiltrated with a new growth of carcinoma."

DR. T. M. PRUDDEN said that it was well worth while bringing these three specimens together, for, while cancer of the liver with extensive involvement of the organ was commonly enough met with at autopsies, it was very rare to see a collection of cases, such as this, in which the lesions were in such an early stage. He was glad that Dr. Ely had stated his views concerning the origin of cancer of the liver, and his theory, if accepted, would simplify the question very much. It has been said that the presence of cylindrical cells in carcinoma of the liver shows that the tumor is from the gall-ducts, and if cylindrical cells are not found that it is a tumor of the liver proper. This is not correct, however, as the epithelium of the gall-duct is not composed entirely of cylindrical cells. The specimen presented by Dr. Freeborn would ordinarily be regarded as one of primary cancer of the pancreas, but taken in connection with the other specimens shown it could rightly be considered as occurring by extension from the bile-duct.

DR. VAN GIESON thought that the specimen presented by Dr. Freeborn was one of considerable importance, because it resembled other cystic forms of pancreatic disease, such as result from hemorrhagic pancreatitis. When death has taken place in an early stage of hemorrhagic pancreatitis we often find the lesion surrounded by zones of pancreatic tissue. But when the disease has existed for a longer period, it is found that the ascending peritonitis has resulted in the production of a wall incapsulating the pancreas. The tumor then becomes amenable to

surgical treatment, and successful cases of removal have been reported by Gussenbauer and Thiersch.

The intestines, matted together by the peritonitis and forming a wall around the pancreas, are very likely to be perforated, and sometimes the pancreas escapes in this way from the newly formed capsule. Rokitansky has reported such a case, and Chiari relates an instance in which no less than fifteen apertures were found in the wall surrounding the cyst.

DR. GRAUER reported a case that he had seen in Weigert's laboratory, Frankfort, of primary cancer of the gall-bladder, with secondary growths along the ducts and extending into the liver. He noticed that the gall-bladder was full of gall-stones, and Weigert told him that in his experience these concretions were always present in cases of primary cancer of the gall-bladder.

DR. FREEBORN called attention to

A NEW LAMP FOR ILLUMINATING THE FIELD OF THE MICROSCOPE,

devised by Dr. Koch. It consisted of an oil lamp with an ordinary argand burner. Fitting over the chimney was a sheet-iron shade in which were two apertures for the insertion of solid glass rods. One of these rods was curved so as to terminate beneath the stage of a microscope. The light from the burner was conveyed along this rod, and, after passing through a disk of blue glass to cut off the yellow rays, furnished a brilliant illumination for the examination of objects by transmitted light. The other rod was shaped so as to throw a light above the object when it was desired to examine it by direct illumination.

DR. R. G. FREEMAN presented a specimen showing

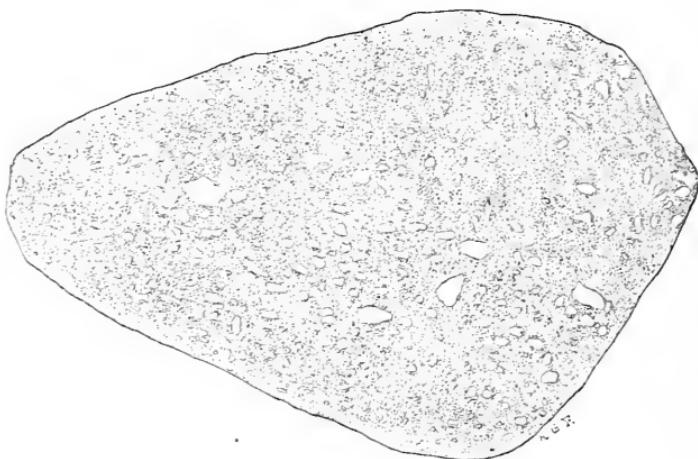
MULTIPLE CAVITIES IN THE LIVER FROM POST-MORTEM DECOMPOSITION.

"This specimen is from a Polish woman, aged thirty, who died at Bellevue Hospital, when eight months pregnant, from rupture of the uterus. The autopsy was made by Dr. Prudden, through whose courtesy I am able to present the specimen.

"*Autopsy*, November 11, 1888, thirty-nine hours after death. Body fairly nourished; decomposition advanced. Liver full of small cavities, one to three millimetres in diameter; these cavities showed no special distribution along vessels, nor were they more numerous in one part of the organ than another; they were for the most part elongated, closed cavities.

"No cavities of this sort were found in the other organs. The liver was preserved throughout in alcohol. Microscopic examination showed the cavities to be sur-

rounded by no membrane, nor was there any cell-infiltration in the surrounding liver-tissue. The edges of these cavities were in some cases ragged, in others smooth; some of the cavities contained a granular substance; in the vicinity of the cavities, as a rule, the nuclei did not stain. The bacteriological investigation was begun with the Grour stain, but staining with the aqueous solution of fuchsine gave much better results. Groups of large, stout bacilli were found here and there, while between the lobules throughout the liver occasional bacilli could be



seen. In places the hepatic artery was filled by a great mass of these bacilli; many were also seen in the portal veins.

"Dr. Prudden tried to get cultures in gelatine from the liver, but no growth of micro-organisms took place.

"I have found no case similar to this reported. Through the kindness of Dr. Delafield, however, I am able to refer to two very similar cases observed by him, the material of which I have worked over and compared with that of Dr. Prudden's case. The first of these died of typhoid fever with perforation and peritonitis.

"*Autopsy*.—Body not well preserved. Liver showed multiple cavities, which varied in size from microscopic proportion to 3 mm. The liver was hardened in Müller's fluid.

"The second case died after several attacks of unconsciousness, with cyanosis.

"*Autopsy* in eight hours. Kidneys: Suppurative nephritis; no bacilli found. Liver: Studded with small whitish nodules, of the size of a pin's head, in some of which are cavities. The liver was hardened in Müller's fluid. The microscopic examination of these two cases showed practically the same condition as in Dr. Prudden's case.

The white nodules mentioned in the second case were areas of intense bacterial invasion, and in which the nuclei did not stain. The same large stout bacilli were present in great numbers.

"These cavities, then, since there is no evidence of inflammatory change in the liver, are probably a post-mortem change due to the introduction through the circulation of putrefactive bacilli and the generation of gas by them; it is interesting, however, to note that in one case the autopsy was performed eight hours after death, during the winter months. The possibility of bacterial invasion during the preservation in Müller's fluid was obviated in the last case, where the liver was put directly in alcohol. This case has been thought worthy of presentation to the Society because the condition of the organ simulates a lesion."

DR. PRUDDEN said that cultures from this case were attempted on gelatine only. Nothing grew, but possibly better success might have attended trials in other media.

DR. WILLIAM P. NORTHRUP presented some specimens showing

MILIARY GUMMATA OF THE LUNGS, LIVER, SPLEEN, KIDNEYS,
AND LYMPHATICS IN A CHILD NINE MONTHS OF AGE.

A male child, aged nine months, was returned to the New York Foundling Asylum from the Out-door Department, suffering from moderate conjunctivitis, and, in addition, "seemed sick;" it had a temperature of $102\frac{1}{2}$ ° F., and slight increase in rapidity of respiration. It died thirty-six hours after entrance. There was no eruption, and no diagnosis was made.

Autopsy, fourteen hours after death. Brain: Normal. Pharynx and larynx: Catarrhal inflammation, with moderate swelling of the mucous membrane, and superficial ulcers at the base of the tongue and between the arytenoid cartilages. Lungs: Bronchial and tracheal glands enlarged and cheesy. There were no adhesions. On the surface of the lungs were three to five miliary bodies like tubercles. On section four to six pea-sized cavities, with thick walls and with branching processes, were found. No hepatization. Heart: Normal. Liver: Thickly studded with round, opaque yellow bodies two to five millimetres in diameter. These on section showed a granular centre surrounded by a pellucid zone. There were a few bile-stained points in the centre, obviously the openings of gall-ducts. The whole organ was the seat of extensive fatty infiltration. The coeliac lymph-nodules were markedly enlarged and mostly cheesy. Spleen: Firm, dark, moderately enlarged; ten to twelve miliary, opaque white bodies were found on the surface and on section.

Stomach : Normal. Intestines : Contents, bile-stained mucus.

Microscopic examination showed the nodules to be characteristic gummata of the lungs, liver, spleen, and kidneys, and of the lymphatics at the root of the lungs and at the cœlic axis.

CANCER OF THE UTERUS, WITH INVOLVEMENT OF THE OVARIES.

DR. H. J. BOLDT presented two cancerous uteri, obtained by vaginal hysterectomy. In the first case the patient had suffered from hemorrhages only a short time; in the second case, however, the disease had existed, judging from the symptoms, fully six months, and the cancer involved the body of the uterus. In this case the interesting feature was that the ovaries were simultaneously involved. This possibility existing in cases in which the body is diseased showed the importance of always removing the appendages, although formerly it had not been the speaker's habit to do so unless it could be done without trouble. The lesson learned in this instance, however, would lead him always to follow this procedure in the future.

Dr. Boldt presented a third specimen, showing a

SARCOMA OF THE OVARY,

removed on the previous day. The main symptoms present were menorrhagia and pain on the affected side.

A fourth specimen was one of

OVARIAN CYSTOMA,

with beginning malignant changes in the thickened wall of the tumor near its origin. It had existed over two years and had attained a large size. It showed the importance of operating early in all cases of ovarian tumor. All the patients from whom these specimens were removed were doing well.

DR. R. H. SAYRE presented a knee-joint, removed by amputation, showing lesions of

ACUTE OSTEOMYELITIS FOLLOWING TUBERCULAR ARTHRITIS
OF LONG STANDING.

The patient had had knee-joint disease for five years, the trouble coming on after an attack of measles. Last July he was seen by Dr. Sayre, and his knee was at that time flexed and swollen. Abscesses formed and were opened. The patient went to the country, contrary to advice, without having proper protection for his knee, and when he returned there was more marked trouble in the knee, and he had a high temperature and other constitutional symptoms. The leg was amputated in the upper third of the

thigh. The medullary canal was scraped out sufficiently, as it was supposed, but the patient now has a return of the high temperature, and there is evident extension of the disease in the bone.

DR. FRANK GRAUER presented some specimens removed at autopsy from the body of a young man, showing

MALIGNANT ENDOCARDITIS

affecting the mitral, aortic, and tricuspid valves. There were infarctions in the spleen and small miliary abscesses in the kidneys and liver. In the left lateral ventricle of the brain a large hemorrhage had occurred which had extended both anteriorly and posteriorly. Throughout the brain there were also small extravasations and abscesses. Cultures made from the lesions in the kidney showed the presence of a micro-organism supposed to be a streptococcus. In the small intestine, in the neighborhood of the ileo-cæcal valve, were found small nodules thought to be tubercles, and a little above this point was another collection of tubercles. These were the only tubercles found anywhere in the body.

Dr. Grauer also presented a specimen showing

TYPHOID ULCERATION OF THE INTESTINE.

The Society then went into executive session.

Stated Meeting, March 27, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

THE special order of the evening was the presentation of specimens illustrating

LESIONS OF THE GASTRO-INTESTINAL CANAL.

DR. JOHN S. ELY presented a specimen showing

PIGMENTATION OF PEYER'S PATCHES,

supposed to be secondary to chronic congestion. Irregular, dark-brown streaks and spots of pigment gave a shaven-beard appearance to the Peyer's patches, and a few spots of pigment in other parts of the intestine seemed to be in the solitary lymph-nodules. The gut was from an Italian, about thirty-five years of age, who had pleurisy with effusion on the right side and broncho-pneumonia of the left lower lobe. Dr. Ely said that but little notice is taken in the books of this form of pigmentation, but that two situations for it are described—in the centres of the lymph-nodules and in the connective tissue around them. He thought, from the appearance, that the latter was the arrangement in the specimen presented.

Besides the pigmentation above referred to, there was

A DIVERTICULUM FROM THE ILEUM

about three feet above the ileo-caecal valve, the usual site of Meckel's diverticulum. It was about three inches long and had the circumference of the small intestine. Dr. Ely said that the usual point of origin of these diverticula was opposite the mesenteric attachment, and that they ordinarily had no mesentery, but that the one presented originated from the side of the gut near the mesenteric attachment and was provided with a mesentery of its own. Its cavity freely communicated with that of the ileum. A blood-vessel of considerable size ran along the upper wall of the diverticulum nearly to its end, and it was suggested that this might be the remains of the omphalo-mesenteric vessels of the foetus. That the diverticulum was lined with mucous membrane was shown by the presence of one of the pigmented Peyer's patches, half in the intestine and half in the diverticulum.

Dr. Ely also presented a specimen for Dr. Hodenpyl, which illustrated one of the conditions which may result from

PERSISTENCE OF THE OMPHALO-MESENTERIC CANAL,

of which Meckel's diverticulum is the remnant. The specimen was from a child, six months old, which since

birth had had a small tumor, somewhat resembling a polypus in appearance, about three-fourths of an inch long, and an inch in circumference, protruding from the umbilicus. Dr. R. J. Hall, under whose care the patient was, discovered an opening in the centre of this tumor, through which a probe passed, apparently into the intestine. He ligated the mass at its base and excised it. The wound healed rapidly. Microscopical examination showed the tumor to be covered with mucous membrane closely resembling that of the small intestine, but infiltrated with small round-cells and broken down in parts. These changes were thought to be the result of exposure. The central canal, through which Dr. Hall had passed the probe prior to operation, was also found to be lined with mucous membrane similar to that covering the tumor externally. Immediately beneath each layer of mucous membrane the connective tissue and muscular layers of the intestinal wall belonging to it were to be seen, so that from without inward there was mucous membrane, submucosa, circular muscular fibres, longitudinal muscular fibres, subserosa, longitudinal muscular fibres, circular muscular fibres, submucosa, and mucous membrane again, lining the central canal. In other words, there had been complete prolapse of a portion of the persistent omphalomesenteric canal.

At the meeting of December 14, 1887, Dr. L. Emmet Holt presented a similar specimen to this Society, and afterward published the case in full, with a review of the literature, in *THE MEDICAL RECORD* (xxxiii., 1888, 431).

Dr. Ely presented several other specimens for Dr. Hodenpyl, illustrating

TUBERCULOSIS OF THE INTESTINE.

The first was interesting because the lesion in the intestine was confined to Peyer's patches, and resembled the lesion in the early stages of typhoid fever. A distinguishing feature was at once apparent, however, on inspecting the peritoneal surface of the gut, for in the immediate neighborhood of the Peyer's patches the lymphatics were distinctly outlined by miliary and submiliary tubercles scattered along their course. In one place it was thought that a miliary tubercle had blocked the lumen of the lymphatic and caused a damming back of its contents, since the vessel was uniformly dilated and filled with a milky liquid. These changes are well described by Orth.

A specimen of

TUBERCULAR PROCTITIS

was shown. It occurred in a patient not known to have tuberculosis, and had been diagnosticated carcinoma.

A third specimen illustrated

TUBERCULOSIS OF THE VERMIFORM APPENDIX,

which the speaker thought to be quite rare. The patients from whom these three specimens were obtained were all affected with chronic phthisis, and the lesions in the intestine were secondary.

DR. BIGGS said that he did not regard tuberculosis of the appendix vermiciformis as of very infrequent occurrence, but, on the contrary, his experience led him to believe that it was quite common. He had often found it at autopsies, sometimes even when no tubercular lesions were to be encountered in other portions of the intestinal canal.

DR. T. MITCHELL PRUDDEN showed some

HAIR-BALLS FROM THE STOMACH OF A PIG.

The balls were made up of the hair of the pig, which had been licked off and swallowed, mixed with sand and other matters. The hair had a curious spiral arrangement showing the effect of the gastric movements. These hair-balls are found very commonly in the pig's stomach, but their occurrence is of interest by reason of the bearing that it has on human pathology, since they are sometimes found in the stomach of man.

Dr. Prudden then showed two

HAIR-BALLS FROM THE STOMACH OF A YOUNG WOMAN,

which had been removed by Dr. Finder, of Troy, and presented by him to the museum. There were two balls, one considerably larger than the other, which were made up of human hair, horse-hair, threads from blankets, pieces of string, etc. The girl had been insufficiently fed in her youth, and had got into the habit of swallowing many kinds of inert and indigestible substances.

Other specimens were presented of hair-balls from the cow's stomach, and also a number of concretions removed from the alimentary canal of an animal. These concretions were examples of

ENTEROLITHS,

which were formerly in great repute as drugs, being popularly considered as specifics in the treatment of nearly every disease to which man is liable.

DR. HERMANN M. BIGGS presented some specimens of

STRICTURE OF THE JEJUNUM,

associated with disease of the cæcum and vermiform appendix.

For about ten years prior to 1884 the patient, a man, forty-two years of age, had suffered from what he called

attacks of wind colic. In March of that year the pains became localized in the right iliac region ; an abscess formed, and was opened. The wound healed rapidly at first, but a small fistula remained through which air and fecal matters were passed. Three months later the external opening of this fistula was closed, as a result of treatment, but reopened after four years. During the greater part of this time, however, he was unable to take any solid food, on account of severe colicky pains which it caused, and was therefore confined almost entirely to a fluid diet. The amount of nourishment which he was able to secure in this way was insufficient to give him strength enough to permit him to work.

The patient was admitted to Bellevue Hospital in April, 1888, and was operated upon in June of the same year. On following up the fistula a large opening was found in the cæcum. The operation-wound healed readily, but the fistula did not close. In September Dr. Hartley operated again. The edges of the rent in the cæcum were freshened, and then united by two rows of sutures. The patient did well after the operation, but died in January of the present year from an attack of facial erysipelas and acute laryngitis.

At the autopsy an external opening was found in the right inguinal region, communicating by separate channels with the head of the cæcum and with the ileum. In the lower portion of the jejunum was a very tight stricture, barely admitting a small probe. The intestinal mucous membrane down to this point seemed to be perfectly normal. Below the seat of the stricture was found a small cicatrix, but it was longitudinal in direction and was not of sufficient size to cause any noticeable contraction. It was easy to understand, from the presence of this stricture, why the patient should have had wind colic. The veriform appendix was apparently absent, and a large sinus was found extending from the cæcum just at the level of the ileo-cæcal valve. The valve itself was almost obliterated. There was a small opening, scarcely one-quarter of an inch in diameter, directly between the colon and small intestine.

A second specimen was presented of

INTERNAL STRANGULATION OF THE INTESTINE.

The patient was a young unmarried woman who gave no history of any previous illness. She had had a child four years before. A few days before her death she was seized with intense abdominal pain, nausea, and vomiting. The latter persisted in spite of treatment, and increased in severity. Cathartics failed to act, and the patient finally died. At the autopsy old peritoneal adhesions were found, and two or three small coils from about the middle of the

cæcum had passed through an opening in these adhesions and had become strangulated. The condition, had it been diagnosed, might easily have been relieved by a laparotomy.

Dr. Biggs then presented a third specimen, illustrating a form of disease in which we sometimes have very few symptoms, viz.,

MALIGNANT DISEASE OF THE UPPER PART OF THE RECTUM.

The patient had complained of some trouble with the bowels, but had very little pain, and was not supposed to be suffering from any very serious disease. Suddenly very severe pain came on, and the patient died in a short time. At the autopsy a tumor was found in the upper portion of the rectum. Very deep ulcerations were present, and in two places the bowel was seen to be perforated. Both these perforations opened into the same ulcer, although they were separated the one from the other a distance of from one-half to three-quarters of an inch.

DR. L. EMMET HOLT presented a specimen of

PIGMENTATION OF THE INTESTINE.

It was removed from a child, three months old, who had died with marasmus without presenting any special clinical history. The pigmentation was very marked in Peyer's patches, in the colon, and in the mesenteric glands. There was no disease of the suprarenal bodies.

DR. W. P. NORTHRUP presented a gross specimen from a case of

ACUTE GASTRITIS AFTER THE ADMINISTRATION OF TURPETH MINERAL.

To a child, aged fourteen months, affected with diphtheria of the larynx and croup, was given an emetic of turpeth mineral (gr. iij.). This did not produce emesis, and one hour later ipecac was given and vomiting ensued. Three hours after the administration of the turpeth mineral the patient died. Cause of death, diphtheria of the larynx and broncho-pneumonia. The irritating emetic was not thought to have contributed to the fatal result, as the patient was in a dying condition when it was given.

This specimen and that of the following case were shown together to illustrate the irritant action of this mineral emetic.

On autopsy the stomach was empty, its walls in its cardiac half coated with thick, tenacious mucus, embracing small scattered masses of yellow sulphate of mercury, the mucous membrane beneath being intensely congested. The remaining portions of the stomach were normal, and the intestines were also normal.

The following was quoted from "The National Dispensatory of Stillé and Maisch," p. 786:

"*Turpeth mineral* is a powerful irritant, and, in sufficient doses, may act as a corrosive poison. . . . Several fatal cases are recorded. In a recent instance a healthy child, aged five months, died, poisoned by five grains of this preparation eleven hours after taking it. . . . Drs. Randolph and Roussel report the cases of five men, each of whom had at first five grains, and later three grains of the medicine. . . . The employment of so dangerous a remedy in a disease which involves no danger to life is inexcusable. The emetic action of this preparation is the first stage of its poisonous operation. The dose fitted to produce that effect is from two to three grains for a child. . . . It seems to be a superfluous article of the *materia medica*."

The same authors speak of its causing salivation.

Dr. Northrup then presented gross mounted specimens and microscope-sections from

A CASE OF ACUTE ULCERATIVE GASTRITIS AND NODULAR ENTERITIS, AFTER DIPHTHERIA OF THE LARYNX AND THE ADMINISTRATION OF TURPETH MINERAL.

To a male child, aged three and one-half years, suffering from diphtheria of the larynx and croup, was given an emetic of turpeth mineral (gr. iij.). No emesis was induced by it, and an hour later the dose was repeated. Two hours after the administration of the first dose vomiting ensued.

Twelve hours later the patient died. Cause of death, diphtheria and broncho-pneumonia. Before the urgent symptoms of croup set in the patient had been taking corrosive sublimate, gr. $\frac{1}{50}$, diluted in an ounce of water, every hour for twelve hours. The bichloride frequently reddens the mucous membrane of the stomach, and in diphtheria the solitary and agminate lymph-nodules of the small intestine are often enlarged moderately.

Dr. Northrup expressed the belief, however, that the excess of the lesion was due to the action of turpeth mineral.

On autopsy, in the cardiac half of the stomach, and more especially along the greater curvature, were found broad superficial ulcers, upon which was lying a thick coating of tenacious mucus and necrotic epithelium, with small scattered masses of turpeth mineral. The mucous membrane of the pyloric half and greater curvature was intensely congested, coated with mucus, with a few flakes of the mineral emetic distributed through it.

Intestine: The lymph-nodules from pylorus to lower third of ileum—single and agminate—were exceedingly

enlarged. The mucous membrane was deeply congested in areas, coated with dirty brownish and greenish mucus, having here and there small masses of turpeth mineral surrounded with greenish mucus. Resting upon a Peyer's plaque, at the lowest part of the ileum affected, was a small mass of the emetic. The plaque was much congested and dusky and swollen. This point marked the limit of the congestion and excessive enlargement of the nodules and the presence of the mineral.

The remaining portion of the ileum and the colon were not congested; the lymph-nodules were slightly enlarged and the surface was thinly coated with mucus. In the colon was still castor-oil.

Case I. showed the effect of the presence of turpeth mineral in the stomach for three hours—localized severe inflammation.

Case II. shows the effects after twelve hours' presence—ulcerative gastritis—severe enteritis, with marked enlargement of the lymph-nodules as far as the mineral had advanced.

Microscope-examination of the seed-like bodies diffusely scattered through the small intestine of Cases I. and II. showed simple hyperplasia of the lymph-nodules.

Some other gross specimens and microscope-sections were presented, illustrating a case of

ENTERITIS WITH SWOLLEN PEYER'S PLAQUES AND ENLARGED FRANGIBLE SPLEEN.

A female child, five months old, wet-nursed, vomited two or three times two days before death—temperature, $99\frac{1}{2}$ ° F. in the rectum. Her bowels moved freely after castor-oil. On the following day the patient went into collapse and died two hours later. No convulsions.

On autopsy was found marked swelling of Peyer's plaques and of a few solitary lymph-nodules of the small intestine, swelling (universal) of the mesenteric lymph-nodes, swelling and softening of the spleen. Heart, brain, stomach, and kidneys, normal. Colon nearly normal.

Dr. Prudden made cultures from the case for typhoid bacilli; none were found.

Microscope-examination of Peyer's plaques showed simple hyperplasia of lymph-nodules.

Dr. Northrup also presented gross specimens and microscope-sections from a case of

DIPHTHERIA OF THE PHARYNX AND OESOPHAGUS.

The interest of this case consisted in the particular location of the diphtheritic process in the pharynx and the extensive ulceration of the oesophagus.

One week before death the child, aged fourteen months,

was affected with ulcerative stomatitis. Five days later a thin pellicle of pseudo-membrane was first discovered on tonsil. There was a suspicion that diphtheria was present before this time, but no membrane could be found. Diarrhoea the last two days of life.

On autopsy the tonsils were not swollen and no false membrane was found, excepting at the very lowest part of the pharynx, in the sinuses at the sides of the larynx called laryngo-pharyngeal. These corners were ulcerated, covered with rather thick slough, and on microscope-examination proved to be diphtheritic, having the usual characteristics, including numerous colonies of micrococci. There was then softening diphtheritic membrane in a position to drain directly into the beginning of the alimentary canal. The oesophagus, when opened, showed two straight rows of ulcers, circular, punched-out, having elevated walls, a little undermined, clean floor, varying in size from seven to three millimetres. These two rows were exactly opposed to each other before the oesophagus was slit open. The microscope-examination added only negative testimony, and the reasonable presumption was that the ulcers were of diphtheritic origin and that the necrotic tissue had sloughed away, leaving clean ulcers.

The stomach was covered throughout with a uniform grayish pellicle, not tenacious, this resting upon a congested mucous membrane. Microscopic examination showed catarrhal gastritis—no pseudo-membrane. There was also catarrhal entero-colitis.

A card specimen of a microscope-slide was then presented, showing

TUBERCULAR TISSUE FROM A JOINT

removed by operation. The specimen was of interest, showing unusually large and typical giant-cells, also the close grouping of typical tubercle granules with very little tissue between them—the whole arrangement being almost "schematic."

DR. HOLT, referring to the case of intestinal lesions found after the administration of turpeth mineral, said that he did not think the glands could have become so greatly enlarged in so short a space of time as had elapsed between the exhibition of the drug and the death of the child. Might not the lesions have been due to the action of the diphtheritic poison, independent of the presence of the mercurial?

DR. MESSENGER said that he had used turpeth mineral a number of times in the early stages of laryngitis, and had never seen any but good effects from its employment. He had, however, never given more than one grain at a dose.

DR. ROOSEVELT asked whether an analysis had been made of any of the unused portions of the drug which had not passed through the stomach and intestines, to ascertain if possibly there were not some of the bisulphide of mercury present. He did not think that the explanation of the production of the intestinal lesions, offered by Dr. Northrup, was entirely satisfactory ; for, if the inflammation in both the stomach and the small intestine were caused by the turpeth mineral, why should it be most marked around the collections of the drug in one organ and be a diffuse inflammation in the other ?

DR. PRUDDEN thought that it was a little hazardous to refer the production of the intestinal lesions wholly to the action of the turpeth mineral, since the diphtheritic poison was capable in itself of causing a swelling of the glands. Might not the lesions be due to the combined action of the poison of diphtheria and of the turpeth mineral ?

DR. NORTHRUP said that he still saw no reason to doubt the correctness of his assumption. As far down the intestine as the lesions extended the presence of the turpeth mineral was found, but below this point, in the portions not yet reached by the poison, the intestine was normal. To his mind the relation of cause and effect seemed most evident, despite the objections raised by the several speakers discussing the case.

DR. H. M. BIGGS presented a specimen of

PERICARDITIS WITH EFFUSION IN A CHICKEN.

The amount of effusion was very great, and there was almost a perfect mould of the pericardium, made up apparently of fibrin and pus. There were also some small nodules on the surface, the nature of which he had not yet had time to ascertain, as the specimen had been received but a short time before and had not been carefully examined.

A second specimen was one of

ACUTE MILIARY TUBERCULOSIS.

The miliary tubercles were present in enormous numbers in the peritoneum, liver, lungs, and other organs. In searching for the source of infection the only old tubercular lesion to be found was in the articulation between the first and second pieces of the sternum. Here there was some cheesy matter containing tubercle bacilli. No other source of infection could be found anywhere in the body.

DR. SARAH J. McNUTT presented a specimen showing

INTRACRANIAL HEMORRHAGE

in a child eight and a half months old.

A male child, eight and a half months old, was admitted to the Babies' Hospital for gastro-intestinal catarrh and

congenital syphilis. Child died, March 26th, of inanition. There had been no history of convulsions or injury.

Autopsy, twenty-four hours after death, showed marked emaciation; there was evidence of a gastro-intestinal catarrh of long standing, oedema of the lungs was present, and the heart was distended by a dark clot. The liver, spleen, and kidney were apparently normal. The bones of the skull were thin, membranous in appearance, and could be readily cut by scissors. The anterior fontanelle measured three inches in its antero-posterior, and two inches in its transverse diameter. On cutting through this fontanelle two ounces of fluid, the color of weak coffee, escaped. The arachnoid membrane was seen to be thin, transparent, and raised by a clear, colorless fluid, in marked distinction from the rusty-colored fluid that had escaped on opening the skull. Lining the right frontal and parietal bones in their lower third, and also the adjacent skull-bones, was a thin, very vascular membrane, covering an area of two by three and a half inches, the vertical diameter being the shorter. This membrane, although adherent to the dura, was readily separated from it, leaving it pale and evidently free from hyperæmia. Beneath this membrane, at its centre, was a thin clot of blood about the size of a quarter of a dollar. No rupture of the blood-vessels of the pia could be found, nor any injury to the substance of the brain. The pathological condition would seem to have been caused by a haematoma of the dura mater, as in pachymeningitis haemorrhagica.

DR. FRANK GRAUER presented some specimens illustrating

ACUTE MILIARY TUBERCULOSIS,

removed from the body of a young man who had died in the Harlem Hospital. Up to four weeks before admission he had been apparently in perfect health. His chief complaint then was of severe pain, which was thought to be neuralgic. Upon admission his pulse was 68, temperature, 100.5° F., and there was slight rigidity of the muscles at the back of the neck. He soon became delirious. A diagnosis was made of meningitis. At the autopsy there was found to be acute miliary tuberculosis. The lungs were studded with tubercles, and tubercles were found also in the liver, spleen, and kidneys. The kidneys also contained small abscesses. The mesenteric glands were enlarged, tubercular ulcers were found in the intestine, and the brain also contained numerous tubercles.

A second specimen showed

ACUTE YELLOW ATROPHY OF THE LIVER.

At the time of admission to the hospital the patient was jaundiced and had oedema of the lower extremities. He

was delirious, and remained in this condition until his death. At the autopsy hemorrhagic infarctions were found in both lungs. The heart was very pale, the aorta was atheromatous, and the coronary arteries were diseased. The peritoneum showed numerous points of hemorrhage, and there were also hemorrhages in the mesentery. The stomach and intestines were very much congested. There was meningitis, not very pronounced, and areas of hemorrhage were found in the brain. The liver was in a condition of acute yellow atrophy. Some fresh sections of the liver were examined under the microscope, but were not very characteristic of acute yellow atrophy. Other sections had also been made, but had not yet been examined.

The Society then went into executive session.

Stated Meeting, April 10, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

REPORT OF THE COMMITTEE ON MICROSCOPY.

EXAMINATION of the specimen referred to the Committee by Dr. S. J. McNutt, at the meeting of March 27th, shows it to be the newly formed membrane of pachymeningitis interna hæmorrhagica. No lesion in the substance of the brain was apparent. Respectfully submitted, JOHN S. ELY, IRA VAN GIESON.

DR. H. P. LOOMIS presented a specimen of

MEDULLARY CANCER OF THE KIDNEY.

The tumor was removed from the body of a woman, twenty-eight years of age, who died in Bellevue Hospital. The principal complaint was of intense pain in the left side. At the autopsy the left kidney was found greatly enlarged, and on section the tumor was found to be a medullary cancer. It consisted of a thick, grumous material, and scarcely any true kidney tissue was found. The condition was rather a rare one in the speaker's experience.

Dr. Loomis also presented a specimen of

CHRONIC DIFFUSE NEPHRITIS, WITH CONTRACTED KIDNEY,
IN A CHILD ELEVEN YEARS OLD.

"The patient was a girl, eleven years of age, the second of four children. The eldest is now sixteen, and the youngest died in infancy of hydrocephalus. Her father contracted syphilis one year before the birth of his first child, and died when the patient was six years of age, having been an invalid for a number of years. Her mother has always been well. There is no history of gout in either parent's family. Her mother's family is rheumatic, and her father's phthisical. The patient was of feeble physique, but had never been severely ill, except with whooping-cough and chicken-pox.

"The first symptoms of renal disease developed about a year before her death. Albumin and casts were constantly found in the urine during the last eight months of life, and there was gradually developed marked left ventricular hypertrophy. The other usual symptoms of chronic diffuse nephritis were well marked. The direct cause of death was lobular pneumonia, attended by suppression of urine and uræmic symptoms.

"Autopsy, made fifteen hours after death.—Body emaciated; some oedema of the ankles; slight puffiness under the eyes.

" Heart : the wall of the left ventricle was one inch in thickness, the cavity was not dilated, and there was no valvular lesion.

" Lungs : there were the characteristic appearances in both lungs of lobular pneumonia. The liver and spleen presented a normal appearance.

" The kidneys were about one-third their normal size ; capsule thickened and adherent ; surface granular ; color pale ; cortex diminished in a few places ; markings generally absent. A microscopical examination showed the following changes : An obliterating endarteritis of almost all the smaller arteries ; the external coat of the arteries was also thickened ; there was a large amount of connective tissue increase not only around the tufts and between the tubes, but also in dense patches throughout the cortex. Many of the glomeruli had the appearance of having undergone amyloid change, but the gentian-violet test showed that the material was not waxy. The tubes showed granular fatty degeneration.

" About a year ago the patient's older sister, without any apparent cause, developed all the symptoms of Bright's disease, and has been growing steadily worse ever since, following a similar course to her sister. To-day she has cedema under her eyelids, hypertrophy of the left ventricle, complains of severe headache, and is often so drowsy that she can with difficulty be aroused. Albumin and casts appear in the urine at times.

" In reviewing the history of these two cases the only conclusion which I can come to is, that the syphilitic taint inherited from the father showed itself in the children by the development in the kidney of the changes which are characteristic of such a condition.

" Neither of the children had had scarlet fever, nor were there any signs of renal disease until they reached in the one case the age of ten, and in the other the age of fifteen years. This seems to bear out the statistics of Fournier of 212 cases of hereditary syphilis, in which he found the symptoms of the inherited infection showed themselves in the maximum number of cases about the twelfth year.

" The kidneys were well-marked specimens of contracted kidneys, such changes are rarely met with excepting in a gouty or syphilitic diathesis. I find the records of such changes in children are exceedingly rare even in the offspring of gouty and syphilitic parents. Ziegler in his work on Pathological Anatomy says that in congenital syphilis induration and contraction of the kidneys have in somewhat rare instances been observed. Possibly these kidneys would come under this category. Certainly neither child presented any other evidence of hereditary syphilis.

" In looking up the literature of the subject I find that

Foster, in 'Jahrbuch für Kinderheilkunde,' describes two almost identical cases of contracted kidneys in children—a boy and a girl, aged respectively four and a half and nine and a fourth years—the offsprings of a syphilitic father. The kidneys were small, and with adherent capsules. There was also left ventricular hypertrophy. These cases had also been referred to by Dr. Delafield in his last article on Bright's disease."

DR. S. T. ARMSTRONG presented the following specimens :

HYPERTROPHY OF THE TUNICA VAGINALIS IN A CASE OF HYDROCELE.

W. P.—, aged twenty, a native of France, a negro, was admitted to the hospital February 14, 1888. He had had gonorrhœa the previous month, with subsequent hydrocele. On the date of admission he was tapped, 200 c.c. of fluid being removed. (The fluid was used for bacteriological purposes.) On February 22d he was tapped, and tincture of iodine was injected, and one week later he was again tapped; the tunica was then so thick that the needle penetrated it with difficulty; iodine was again injected. On April 2d he was tapped once more, and on April 9th he was chloroformed, and the sac excised. The sac showed marked hypertrophy consequent upon new tissue formation. Its serous surface was roughened by the injection medium. (This case is reported at length in the "Annual Report of the U. S. Marine Hospital Service for 1888.")

EPITHELIOMA OF THE PENIS.

T. D.—, aged thirty-eight, New York, admitted January 30, 1889, for ulceration of the penis and prepuce. The remains of the latter were removed under cocaine. At first it was supposed that the ulceration was phagedenic, notwithstanding the history that in January, 1888, a sore appeared on his penis, and was followed by a papular eruption on his body. Subsequently a hard growth remained at the site of the initial lesion, and in the two months previous to admission this had rapidly enlarged. The entire glans was involved, presenting a red, fungous appearance. The penis was amputated, examination having revealed the epitheliomatous character of the growth. Dr. Armstrong believed that this disease was of rare occurrence, at least it was so in the experience of the Marine Hospital Service.

TUBERCULOSIS OF THE EPIDIDYMIS.

H. D.—, aged twenty-nine, Ireland, admitted February 29, 1888. In 1886 the left testicle was injured by a blow from a truck-handle. Subsequently he was operated

on, a small portion, he said, of the testicle being removed. A deep sinus existed, at the time of admission, in the skin of the left scrotum, involving the epididymis. This was incised, but it did not heal. Its tubercular character being demonstrated by examination of the pus, the testicle was extirpated. The patient was discharged April 17th. It is of interest, in connection with the relation of local to general or pulmonary tuberculosis, that this patient was readmitted for tubercle of the lungs on November 20th, and now has large cavities.

CHRONIC ORCHITIS.

O. F. O——, aged twenty-nine, Norwegian, was admitted to the hospital January 4, 1889. In 1886 the left testicle became enlarged without cause, as far as he knows. Two years ago he was treated in New Zealand for hydrocele. An ulcer of the skin occurred at the point of tapping that never healed. When admitted there was a large ulcer of the skin on the anterior surface of the scrotum, involving the testicle. All the lymphatic glands were slightly enlarged, probably in consequence of syphilis acquired sixteen months ago. The testicle was extirpated, and on section showed almost complete fibrous degeneration, but little of the tubular structure of the gland remaining. Undoubtedly the tapping for the hydrocele was an inciting cause, and the short period occupied in the production of the degeneration (two years) is a matter of interest.

DR. F. N. OTIS said that he had been somewhat surprised to learn that epithelioma of the penis was such a rare condition in the experience of the Marine Hospital Service, for he had seen and had operated upon quite a number of cases, and was of the opinion that the disease was one of moderately frequent occurrence in private practice. The results of operation in his cases had been quite satisfactory, and in those which he had been able to follow up there had been no return of the disease.

In regard to the case of thickening of the tunica vaginalis, he asked whether, in Dr. Armstrong's opinion, the thickening was the result of the treatment—of irritation caused by the penetration of iodine. He had seen some cases of thickening of the tunica from ordinary injury. One case occurred in a boy, sixteen years of age, who was struck by a base-ball, and had a hydrocele following. This was tapped several times, and subsequently a hydrocele developed on the opposite side. Dr. Otis saw the boy some two or three years later, and then the scrotum was enormously enlarged, measuring between five and six inches in its long diameter. Several efforts were made to draw off the fluid, but without success, and at last the

speaker made up his mind that no ordinary instrument could pass through the thickened tunica vaginalis, and concluded to incise it. He went down through at least half an inch of the most dense fibrous tissue before coming to the fluid. He did a Volkmann operation. No portion of the tunica was removed, yet the thickening gradually disappeared, and the boy made a perfect recovery. In other cases a similar result had been obtained, and he had found that Volkmann's operation was all that was necessary to restore the tunica to its normal proportions.

DR. ARMSTRONG did not think that the thickening of the tunica vaginalis in his case was due to the action of the iodine employed. He had at first intended to perform Volkmann's operation, but had abandoned the idea, as he feared it would not suffice to effect a cure. Since learning of Dr. Otis' experience, however, he thought that very possibly he might have been successful had he adhered to his first intention.

THE PRESIDENT remarked that the effect of the Volkmann operation upon the thickened tunica vaginalis, in the cases related by Dr. Otis, was perhaps similar to that obtained by the gynecologists in the case of subinvolution of the uterus, as a result of repairing a lacerated cervix.

DR. JOHN S. ELY presented some specimens showing

HYPERTROPHY OF THE PROSTATE GLAND, CYSTITIS, AND PYELO-NEPHRITIS.

"The patient, an American, sixty years of age, first came under observation toward the end of November, when he presented himself at Bellevue Hospital with retention of urine. A soft rubber catheter was passed without difficulty. Enlarged prostate and cystitis were diagnosticated, and the bladder was washed out with one per cent. boric acid solution daily till all pus disappeared. He was then taught to use a soft rubber catheter, and was discharged. He returned to the hospital on January 4th, again with retention, which was easily relieved. Toward the end of January thick pus was noticed to be flowing from the urethra, and abscess of the prostate was diagnosticated. Dr. Hall performed external urethrotomy. The man did well for about a week, then had two chills at about thirty-six hours' interval, was slightly irrational at times, and had a considerable elevation of temperature. He gradually became weaker and died on February 7th of exhaustion.

"At the autopsy the prostate was found to be very much enlarged, especially the left lobe, which measured $6 \times 3\frac{1}{2} \times 3$ ctm., the whole gland measuring $6 \times 5 \times 3$ ctm. The prostatic urethra was compressed so that its lumen was

completely occluded. When cut, the prostate presented the ordinary appearance of the hypertrophied organ. There was no sign of abscess.

"The wall of the bladder was much thickened ($1\frac{1}{2}$ ctm.), and its mucous membrane was velvety, congested, and covered with pus. A small amount of thin pus was in the bladder. The ureters were much dilated, the left somewhat more than the right, which measured about $2\frac{1}{2}$ ctm. in circumference. The pelves of the kidneys were also much dilated and filled with thin pus. The mucous membrane was much congested, and velvety in appearance. The capsule of the kidneys was somewhat adherent, the cortex was thickened and cloudy, and there were occasional points of light yellow color, suggesting small collections of pus. Many of the collecting tubules were much dilated.

"Microscopical examination of the kidney showed the characteristic changes of chronic diffuse nephritis, and also many collections of small round cells, with degenerating nuclei.

"Though this is but an ordinary case, I have thought it worth while to present it to-night, because the picture is so typical and because a practical lesson seems to be pointed by it. I have repeatedly heard Dr. Sands say that the liability to suppurative nephritis after operation was greatly increased by the existence of chronic Bright's disease. He always caused the urine to be carefully examined, and often refused to operate when albumin was present. When pyelitis exists the tendency to infection of the kidney must be great. So long as the strength of the patient can be kept up this may be counteracted in many cases. But weaken the patient by the additional drain upon his resources imposed by operation, and no wonder that the equilibrium before existing should be destroyed."

Dr. Ely then presented a specimen, on behalf of Dr. Hodenpyl, showing an

ENLARGED MIDDLE LOBE OF THE PROSTATE

which had caused a moderate degree of retention, though it had not given rise to very much trouble in this respect. He could give no accurate clinical history of the case.

Dr. Ely also presented a third specimen of

SUPPURATING HYDROCELE.

There was no history of the case, and the specimen had not been obtained until it had become somewhat decomposed.

DR. ARMSTRONG asked whether any strictures of the urethra had been found in the first case reported.

DR. ELV replied that there were no strictures.

DR. OTIS said that the third specimen seemed to be one of ordinary haematocele.

DR. H. P. LOOMIS presented a specimen of

MULTIPLE ULCERS OF THE STOMACH IN A MORPHINE HABITUÉE.

"The specimen was removed from a woman, forty-two years of age, a nurse by occupation, who was admitted to Bellevue Hospital the 29th of March. Her parents died of old age. She denied alcoholic habits and a specific history. The patient was strong and well, up to twelve years ago, when she had to have her foot amputated, and as a result of attempts to relieve a severe neuralgia in the stump, she became addicted to the use of morphine. Since this time she had never been well, and had always taken morphine to excess. For the last three months she had been troubled with incessant vomiting and a severe pain in the epigastric region, and had been growing weaker and weaker.

"On admission to the hospital the patient was vomiting almost constantly ; the material consisted of partially digested food, mucus, and, once or twice, some black coffee-ground material. A microscopical examination of the urine showed it to be normal. After a few days, by keeping the patient on a peptonized milk diet, giving oxalate of cerium and morphine, the vomiting stopped, the pain over the stomach improved, and the patient seemed to be doing so well that the visiting physician, after careful examination, directed that she be transferred to Charity Hospital. While sitting in the ward, waiting to leave the hospital, the patient fell over and died almost immediately.

"*Autopsy*, eight hours after death.—Lungs : the right lung was normal, with the exception of some old adhesions at the apex. The lower lobe of the left lung was bound completely to the chest-wall by new connective tissue-bands, and was almost airless ; the upper lobe was normal. The heart-walls and cavities presented a normal appearance ; there was some thickening at the base of the aortic and mitral valves, and the aorta was atheromatous. The spleen was enlarged and soft. The liver was of normal size, and showed the ordinary appearances of fatty infiltration. The kidneys were intensely congested ; otherwise of normal appearance. The brain showed a slight opacity along the vessels of the convexity, which were intensely congested. Stomach : The organ was of normal size and empty. On opening the stomach, the mucous membrane was seen to be intensely congested, and the surface presented the ordinary appearance of a chronic catarrhal inflammation at the pyloric extremity. On the

posterior surface, and near the lesser curvature, were four ulcers, the largest a half inch in diameter, the smallest the size of a pea. They were of circular shape, with 'clean-cut' edges; their floor showed no active inflammatory changes. One of the ulcers had penetrated as far as the muscular coat, another to the peritoneum, which could be seen as a thin membrane by holding the stomach up to the light. The largest ulcer had perforated, and looked like a clean hole punched out of the wall of the stomach, the edges of which were rounded and smooth. There was no evidence of peritonitis. The intestines were very anaemic and small, but no lesion was found in them."

DR. JOHN C. PETERS said that he had seen some cases of ulcer of the stomach in which the lesions were seated in the upper portion of the organ. The patients were perfectly comfortable as long as they ate only small quantities of bland food; but a large meal would cause pain and discomfort; and, in one instance, a perforation took place in consequence of an indiscretion in this respect.

The Society then went into executive session.

Stated Meeting, April 24, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE
CHAIR.

DR. EUGENE HODENPYL presented a series of specimens illustrating

LESIONS AND MALFORMATIONS OF THE HEART.

Two hearts were shown in which there were chordæ tendineæ stretching across the cavity of the left ventricle. The speaker thought that this was not a very rare condition, and that it would be found more commonly than it is, were care used in opening the ventricle. In one of these cases a murmur was heard before death, but no particular importance was attached to it. He asked what had been the experience of the members present in regard to the production of murmurs by these chordæ. He had seen about fifteen cases of this sort recently, and in only one had the existence of a murmur been noted.

DILATATION OF THE HEART WITH BUT SLIGHT HYPER-TROPHY.

A young man had suffered all his life from symptoms of cardiac trouble. He also had Pott's disease of the spine. At the autopsy there was found an enormous dilatation of the left ventricle, with comparatively but a slight degree of hypertrophy. The aorta in this case was of very small size.

ANEURISM OF THE MITRAL VALVE.

This heart was removed from the body of an old man who had been in the hospital for some time with symptoms of heart disease. He was found dead in bed one morning. At the autopsy the heart wall was found fatty throughout, and there was very marked thickening, with stenosis of the aortic valve. The aorta was atherosomatous. An aneurism, about the size of a filbert, was found on the mitral valve.

AN INCORRECT DIAGNOSIS OF AORTIC ANEURISM.

The specimen was removed from the body of a woman, forty seven years of age, who had suffered from what was supposed to be an aneurism of the aorta. At the autopsy, however, no aneurism was found, there being only a very moderate degree of dilatation of the arch of the aorta. The aortic valves were thickened and stenosed, and one cusp was almost entirely obliterated. There was also a band of fibrous tissue stretching across the cavity of the left

ventricle. On the surface of the lungs, beneath the pleura, were numerous little air-sacs.

APOPLEXY OF THE OVARIES.

The same patient also had two fibroid tumors of the uterus, and the ovaries were rather peculiarly diseased. The surface of the organs was of a purplish color, and on section the cut surface was found to be almost jet-black mottled with white. The black color was found on examination to be due to the presence of altered blood, and the white spots were probably old corpora lutea.

MULTIPLE ANEURISMS.

A man about fifty years of age was admitted to the hospital, suffering from an aneurism of the subclavian artery. The treatment consisted in ligation first of the carotid artery. The patient did well after this operation, and then the third part of the subclavian was ligated. This was not so successful, and the man had a secondary hemorrhage. Then the axillary artery was tied, but the patient died shortly afterward. A few days before death he suffered intense dyspnoea and had a severe cough. At the autopsy an explanation of the dyspnoea was found in the presence of a rather large aneurism of the innominate artery which pressed upon the trachea, narrowing its lumen. There was also a fusiform aneurism of the aorta, which had not been suspected during life.

DR. GEORGE R. LOCKWOOD, JR., said, in regard to the production of a murmur by chordæ tendineæ stretching across the ventricle, that such might very readily occur if the chordæ were attached to a papillary muscle, and were thus rendered tense. In the specimens shown by Dr. Hodenpyl, however, there was no such attachment; the cord would therefore become relaxed during systole, and consequently there could be no vibrations in it to cause a murmur.

DR. FRANK W. JACKSON thought it would be a very difficult matter to diagnose the presence of intra-ventricular bands. It was sometimes comparatively easy to diagnose an intra-ventricular murmur, and he had a patient now under observation with a heart murmur which he was confident was intra-ventricular; but it was a very different matter to determine the cause of this murmur, since several distinct conditions might occasion it.

DR. F. S. McHALE presented a specimen showing

TUBERCULOSIS OF THE PERICARDIUM.

It was removed from the body of a man forty-five years of age, who had had a cough for the past three years. Three weeks before admission to hospital, after

exposure to the wet, he had an increase in the cough, which now became very severe, and pain over the entire length of the sternum. His face was drawn, flushed, and covered with perspiration. For a time there was some oedema of the leg, but this disappeared in about a week. At the autopsy no marked gross lesions were found anywhere except in the heart. This organ was enlarged, and the pericardium was irregularly thickened, and its cavity contained fibrin and pus. The inner surface of the parietal layer was studded with whitish nodules. Dr. Hodenpyl examined the specimen and reported that the new-growth was made up of small spheroidal, epithelioid, and giant cells. Examination of the kidneys revealed the presence of nephritis.

DR. HODENPYL said that it was important in these cases to note the condition of the bronchial and mediastinal glands. Weigert had lately made the assertion that the so-called tuberculosis of the pericardium was always primarily a tuberculosis of the mediastinal glands.

Dr. Hodenpyl then presented two specimens of

TUBERCULAR PLEURISY AND PERICARDITIS.

The first specimen was from a man thirty-four years of age, who had been exposed four months before his death to cold and wet. He developed a cough, and then began to suffer from dyspnoea and loss of appetite. Physical examination revealed a pleuritic effusion on the right side. The patient was tapped several times, a large amount of bloody serum being drawn off each time. At the autopsy the pericardium was found completely adherent and thickened.

The second specimen was one apparently of primary tuberculosis of the pleura, with secondary affection of the pericardium. In this case the bronchial glands were examined and found to be tuberculous. On microscopical examination the sections showed almost the same appearances as those seen in Dr. McHale's case. The tubercles were somewhat cheesy, and contained large numbers of giant cells.

DR. WILLIAM P. NORTHRUP presented a specimen of

ADHERENT PERICARDIUM

with dilatation and hypertrophy of the heart.

The patient was a male child, aged thirteen months. His only illness was double otorrhœa, so far as recorded. He was cross and fretful by seasons. Never had any contagious disease, unless possibly measles. Two days before death his respirations became rapid—60 per minute; the pulse was 160, while his temperature remained 99°. One day before death temperature was 100°, the

extremities were cold, and the child screamed, apparently from pain, and seemed to be dying. He died without convulsions.

On autopsy, the body was found well nourished; brain normal. The heart was enlarged; weight 5 oz. 5 dr. The pericardium everywhere was adherent by loose bands which allowed moderate movement of the adjacent pericardial layers. The auricles and ventricles were dilated, and their walls were hypertrophied. The valves were normal, and the foramen ovale was closed. The great vessels were normal. The lungs were congested, oedematous, and flabby. The bronchial glands were moderately enlarged and dusky. Kidney, cortex pale; marking indistinct.

Dr. R. S. Freeman had looked up the literature of adherent pericardium in young children and had found the following cases reported. E. Cerf¹ reported forty-three cases of pericardial adhesion; of these the youngest was eight years of age. Samuel Wilks² reported six cases in early life; the youngest was nine years of age. A few cases in very early infancy are on record. A case was reported in Vienna where retraction over the apex was noticed on the eighth day, and at the autopsy fresh adhesions were found. Bednor found adhesions in a child of three months. Billard³ makes the following note on the autopsy of a child, aged two days. There were "firm adhesions between layers of pericardium, producing belief that they were the product of former pericarditis developed during evolution of foetus." This condition in a new-born child is also reported by Huetner.

Dr. Northrup presented a second specimen showing

ABSENCE OF THE SEPTUM AURICULORUM,

distalation and hypertrophy of the heart, and acute exudative nephritis in a child aged thirteen and a half months. The child had always been "miserable" and irritable, but never sick. There was no history of scarlet fever or diphtheria, and the child was not a blue child.

On autopsy the heart was found very large, its common auricle being distended with dark clot, the walls of the auricle and ventricles were thickened. The ventricles were empty. There was a thin, membranous, crescentic rudiment, the only attempt at a septum auriculorum. The lungs were moderately congested, uniformly; no consolidation, no bronchitis; slight edema.

Kidneys enlarged, cortex thickened, pale, markings varying from moderately distinct to indistinct and obliterated.

¹ Bauer: Ziemssen, Handb. d. Spec. Path., vol. vi.

² Guy's Hospital Reports, vol. xvi., pp. 196-208.

³ Billard: Diseases of Infants, p. 251. Philadelphia, 1850.

ated. The pyramids were congested, and in them and about their bases were masses of hemorrhage, and within the hemorrhagic masses pale spots. The striations and mottlings were found, under the microscope, to be formed of alternating masses of pus and hemorrhage. There were also hyaline casts and drops of cast matter within the tubes; also necrosis of the epithelium of many convoluted tubes. The urine from the bladder showed pus only. Other organs normal.

Four other specimens were presented, showing hernia in children. One of these specimens was of double congenital inguinal hernia. On the right side the cæcum and a few inches of the ileum were in the sac. On the left side the sac was empty. The opening easily admitted the end of the little finger.

DR. ARMSTRONG asked what was the experience of the members present in regard to the frequency of a patent foramen ovale. He had found it so often that he had almost ceased to look upon it as a rarity.

THE PRESIDENT had seen it a number of times, and in many cases there had been no symptoms during life leading to a suspicion of the condition.

DR. FERGUSON said that some three years ago he had presented before the Society a series of specimens of patent foramen ovale. In every instance, however, there was a valve-like arrangement which effectually closed the opening in the septum, one part lapping over the other so that no direct opening existed. There was no cyanosis or other symptom during life pointing to the presence of an incomplete septum.

DR. ARMSTRONG said that in one of the cases of patent foramen ovale which he had seen there were four segments to the valve of the pulmonary artery. He had seen this condition several times.

DR. H. S. STEARNS presented a specimen of

TUMOR OF THE DURA MATER.

The tumor was of rather large size, and examination showed it to be a sarcoma. No extensive clinical history had been obtained, but it was stated that the man had been paralyzed a short time before death.

DR. J. WEST ROOSEVELT presented some corrosion specimens, with remarks upon

SIMPLE METHODS FOR MAKING CORROSION PREPARATIONS SHOWING THE GROSS ANATOMY OF LARGE VISCERA.

My object in presenting these preparations of the heart, lungs, and kidney is to direct attention to the value of the method for study, and also to show that little but patience is required to make them. It is needless to say that no

originality is claimed. Some of the details have not, however, been described before, as far as I know.

Corrosion preparations are usually broken by handling; by currents in the corroding fluids; by unequal corrosion; and a consequent tendency of the specimen to turn suddenly over in the solution as its centre of flotation is changed, or to break because of the unequal support given when the ends of the specimen tend to float higher or lower than the middle.

It is evident, therefore, the first thing is to avoid handling. This is easily done if the organ be fastened to a proper support. All the indications are fulfilled if the various tubes be fastened together and to some support, and if the corroding agent be so applied as to avoid making currents. The support should be arranged so that it prevents sudden turning, and also so that it holds the organ at nearly the same position in relation to the corroding agent, if this latter rise or fall, or if the organ changes its centre of flotation. The method first described applies to all viscera with which I have experimented (heart, liver, spleen, pancreas, and kidneys) except the lungs, which require special treatment.

The cannulae may be of glass or hard rubber, and are inserted and fastened in the usual way. The injection may be made with a syringe or in any other manner. All the pipes should be as large as possible.

After the cannulae are in place the organ is put into a rather deep glass jar, nearly filled with warm water (102° – 110° F.).¹ The injection is then made, and the organ removed to another jar containing cold water. As soon as the mass has cooled in the cannulae the organ is raised by them so that they are above the water-level. A short, stout S-hook of glass is now tied either to the cannulae or to the injected vessels. After this the vessels and the hook are all fastened together, either by pouring melted paraffin over them, or by means of melted shellac. It is then hooked over a piece of thin rubber tubing, which is to be fastened across the mouth of the jar after most of the water has been siphoned off. This tubing should be sufficiently elastic to allow considerable rise and fall of the viscus with the changing fluid level, and also allow it to sink deeper as the lower parts become dissolved. The water is next siphoned off until only enough remains to support the specimen. Strong hydrochloric acid (commercial) is then poured over the surface of the organ in quantity sufficient to raise it nearly to the top of the jar. The rubber tubing, which has until now been left loose, is next fastened to the jar or some convenient

¹ If cold masses be used, of course no warm water is needed.

object. (It is frequently better to have an independent support for the elastic tube. A shallower dish may then be used for the specimen, and this may be put over a deeper one. The various corroding agents may then be allowed simply to overflow the sides of the shallower dish and be siphoned off from the deeper when necessary.) Sufficient strain should be made on the rubber to lift the specimen partly out of the fluid, so that a small portion of its surface is exposed.

After the specimen has been twenty-four hours or more in the acid, this may be replaced by water, poured in through a funnel, the tube of which is carried down to the bottom of the jar. If water supply be available, a glass tube attached to a faucet by rubber tubing may be carried down to the bottom of the jar and a gentle stream turned on. The specimen may remain from one to twenty-four or more hours in water. After this more hydrochloric acid may be added, and the process repeated as often as necessary.

When the specimen is clean it is carefully removed from the jar. If it be very large, several cords may have to be attached to it at different points. It is better, with delicate specimens, to remove the fluid by a siphon than to try to lift them. The siphon makes less current. If paraffin be the basis of the injection, varnish may be now applied, in the manner soon to be described, before any further manipulation.

In dealing with the lungs the process is different, since these organs tend to float so high. If possible, they should be injected in the unopened thorax, the latter being subsequently opened and the lungs treated *in situ*. As this procedure is rarely possible in the human subject, we must, if a fairly accurate specimen is desired, take a cast of the pleural cavity in plaster, and from this make another in wax or paraffin. The lung may be laid in the latter and carried through all subsequent processes. For most cases it is sufficient to proceed as follows : One of the short arms of a glass T-tube is introduced and tied in the bronchus, and cannulae are tied into such vessels as it is desired to inject. To the long (perpendicular) arm of the T a rubber bulb, such as is used in atomizers, is attached. The injection mass is introduced through the other arm. A piece of rubber tubing, having a clip on it, is put on this latter arm. The clip being closed the lung is inflated by means of the bulb with air. It is then placed in a shallow dish, partly filled with melted paraffin. Some of the latter is poured over all the tubes. The injecting syringe is now inserted into the rubber tube attached to the T. The clip is removed and the injection made. When enough of the mass has entered, a little cold water is poured over the T,

and the mass is thus hardened and the tube plugged. The artery is next injected, the vein last. After the injection has cooled a little, several shallow incisions are made on the upper surface. These form a holding-ground for the acid. The upper parts should be first dissolved. Chromic acid in powder is the best agent I have found for this. It is spread over the surface and wetted a little and allowed to deliquesce. It penetrates with wonderful speed. It should be washed off with hydrochloric acid. If the chromic acid does not change to a dark brown color in a few minutes, and rapidly eat its way into the tissue, a little fluid containing organic matter, as saliva, will start it. One danger in the use of this acid is that it sometimes produces a good deal of heat, especially if it come in contact with fat. The hydrochloric acid or water will prevent this. The green color produced by the chromic acid reduced by hydrochloric is easily washed off in water acidulated with nitric acid. A dirty white precipitate may be produced on the specimen. This also is washed off without difficulty. The lungs should not be warmed lest the injection flow too readily.

Most of the masses which I have used have been made of paraffin, one to three parts; yellow wax, one part; and melted dammar, about one-twentieth part. Paraffin of rather high melting-point seems best. This is melted with the wax. The gum is melted in a separate dish. Both the paraffin-wax mixture, and the gum must be raised to a high temperature and then mixed, the gum being added in small quantities at a time and well stirred.¹ It is doubtful whether this mass will stand our summer heat. Probably others made of varnish will be better. The paraffin mass is much strengthened if, after the specimen is dry, a quantity of "fixative" varnish be sprayed over it, so as to coat it completely.

The coloring agents which seem best are vermillion, cobalt blue, chrome green, and chrome yellow.

Cold masses I have only recently begun to use. They have many advantages over the hot. My experience with them is not sufficient to enable me to speak of them. Many beautiful preparations have been made with them by others.

In conclusion, let me say that to make corrosion preparations these points must be remembered: 1. Fasten the tubes together to some support. 2. Do not change the fluids too rapidly. 3. Do not handle more than is absolutely necessary, and when you must, always remember what you wish to avoid injuring. 4. The process

¹ This mass melts at a rather high temperature, but it remains liquid at a temperature sufficiently low to be safe.

cannot be hurried. The only thing to do is to fasten everything securely and wait till the specimen is finished. This merely needs patience.

DR. FREEBORN exhibited a corrosion specimen, showing the terminal air-cells in the lung, which he had made several years ago. The injection material was celloidin. It was mounted in glycerine jelly, which the speaker thought was a very good medium for the celloidin. He had used ninety-eight per cent. alcohol to soften the celloidin and render it less brittle.

DR. H. M. BIGGS presented a specimen of

PATENT DUCTUS ARTERIOSUS.

The patient was a young man about twenty years of age, who was in Dr. Janeway's service at Bellevue Hospital, under treatment for pulmonary tuberculosis. There was a loud murmur heard in the second intercostal space on the left side, accompanied with a very marked thrill. A diagnosis of pulmonic stenosis was made. The patient had but little dyspnoea and no cyanosis. After death the lesions of chronic venous congestion were found, and there was seen to be a patent ductus arteriosus.

Dr. Biggs also showed a specimen of very pronounced

INTERSTITIAL MYOCARDITIS,

removed from the body of a man sixty years of age, who was under treatment for what was supposed to be asthma. He dropped dead one day while crossing the ward in the hospital. At the autopsy there was found to be advanced disease in the smaller arteries, and very marked myocarditis. There was commencing cardiac dilatation, and at one point the wall of the heart was exceedingly thin. There were also found one or two small calcareous plates on the tricuspid valve.

DR. FRANK FERGUSON presented a specimen of

MILIARY ANEURISM

removed from a person who had died of cerebral apoplexy and also one of

PACHYMENTINGITIS HÆMORRHAGICA

occurring in a man sixty years of age, who was supposed at the time of his death to be suffering from ordinary apoplexy.

A third specimen was one of

GIANT-CELL SARCOMA OF THE TONGUE.

It was removed by operation from a man aged forty years, who was thought, by some of the physicians who saw him, to be suffering from syphilitic ulceration of the tongue. The lesion began as a small ulcerated surface which grad-

ually increased in depth, its edges becoming thicker, without any noticeable increase in area. Dr. Ferguson, when he first saw the case, made a diagnosis of epithelioma, and removed the growth. The lesion returned, however, with great rapidity. The glands also became enlarged, and upon removal were found to be sarcomatous.

Dr. Ferguson then presented a specimen showing

INTERSTITIAL MYOCARDITIS.

The patient was a boatman, thirty-nine years of age, of good family history, who had always been well up to within four months of his admission to the hospital. Then he began to suffer somewhat from dyspnoea, and this gradually grew worse until his death, which occurred six days after his entrance into the hospital. At the autopsy there was found to be an aneurism of the aorta which pressed upon the trachea, and the heart muscle was inflamed. The coronary arteries were perfectly normal, but the pneumogastric nerve was pressed upon by the aneurism, and it was to this that the speaker thought the myocarditis was in great measure due.

A fifth specimen was one apparently of

DOUBLE BLADDER.

It was removed from the body of a man who had given no symptoms of bladder trouble during life. The two portions of the bladder were connected by a very small opening. The second bladder was as large as the normal viscous, and was so situated that it made no pressure upon either of the ureters.

DR. BIGGS asked whether there were any stricture of the urethra, for the specimen looked to him like a distended ureter due to retention of urine, and not like an ordinary diverticulum of the bladder.

DR. FERGUSON replied that there was no stricture, and the prostate was not enlarged. He had never seen a case of diverticulum from pressure of the retained urine in which there was such a small opening.

DR. ROOSEVELT did not think that Dr. Ferguson's explanation of the occurrence of myocarditis was needed in the present instance. There was certainly disease of many of the vessels in the body, notwithstanding that the coronary arteries appeared to be normal, and it seemed hardly necessary to invoke the stretching of the pneumogastric nerve in explanation of the phenomenon. The pneumogastric nerve is often found to be pulled upon in cases in which no myocarditis is present. He asked what was the condition of the lungs.

DR. FERGUSON replied that the lungs presented the ordinary appearances seen in these organs in heart disease.

In all the cases of aneurism that he had examined he had never seen a single one with interstitial myocarditis. He did not deny that the condition of the aorta in this case might have had something to do with the production of the myocarditis, but as to the coronary arteries, they were perfectly normal.

DR. BIGGS asked if Dr. Ferguson had ever before seen a giant-cell sarcoma arising from the tongue or in any tissue so far removed from bone.

DR. FERGUSON said that he never had. In this case the tumor commenced apparently in the mucous membrane of the tongue. When he first saw it, it was about the size of a bean. The giant cells were not reproduced, and the glands in the neck presented the appearances of a typical spindle-cell sarcoma.

DR. BIGGS said that he had recently seen a tubercular ulcer of the tongue in which there were very large and typical giant cells. In this case the lungs were tuberculous. Such a case as that reported by Dr. Ferguson must be extremely rare.

The Society then went into executive session.

Stated Meeting, May 8, 1889.

WM. P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. H. P. LOOMIS presented a specimen showing

CONGENITAL NARROWING OF THE COLON,

with extensive dilatation above the constricted portion. It was removed from the body of a woman, thirty-four years of age, who died at Bellevue Hospital, after a three weeks' sickness, from acute tubercular phthisis. The condition of the intestine was not suspected during life.

On opening the abdominal cavity the colon, as far as the splenic flexure, was seen to be enormously distended with gas. From a point just below the beginning of the descending portion of the colon to the anus, the intestine was collapsed, and in size not as large as a normal ileum. A careful examination of the abdominal contents showed nothing abnormal; there was no evidence of peritonitis, no bands of connective tissue, no adhesions, no new-growths, and no twisting of the intestine. On raising the small intestines the descending colon was seen to narrow in a funnel-shaped manner until, about four inches below the splenic flexure, it had reached about half its normal size.

Just below the funnel-shaped constriction was found a round, soft, fecal mass, and scattered throughout the rest of the descending colon and the rectum similar masses were observed. On removing the intestines and making a careful examination, the colon was found perfectly normal, except that the lower portion of the colon and rectum were atrophied. Nothing was found within the intestine except faeces. Dr. Loomis said that he could account for the condition only by considering it congenital. The absence of any apparent cause for the condition, and the fact that the diminution in size was gradual and uniform, seemed to bear out this assumption.

Dr. Loomis also presented a second specimen, showing

A DIVERTICULUM FROM THE LOWER PORTION OF THE
ILEUM.

The diverticulum was found at a distance of about twenty inches from the ileo-caecal valve, and was of about the same diameter as the ileum, and eight inches in length. It presented all the appearances of the normal intestine, as regarded both its mucous membrane and muscular coat. In one case of this kind that the speaker had seen, the patient had died of typhoid fever, and the intestinal lesions of this disease were found in the diverticulum.

DR. J. C. PETERS said that quite a number of cases of intestinal diverticula would be found recorded in the first volume of the "Transactions" of the Society.

THE PRESIDENT said that in making autopsies on children he had often seen the upper portion of the colon enormously distended, while the lower part would be empty and contracted. He had never found any satisfactory explanation of this condition, but the specimen presented by Dr. Loomis reminded him of it. He asked how soon after death the autopsy was made.

DR. PRUDEN said that in cases in which the lower portion of the colon is thrown out of use by reason of a stricture there is very apt to be atrophy of the unused part. In such cases, however, there are some symptoms pointing to the condition present.

DR. LOOMIS said that the autopsy was made some twelve to eighteen hours after death. When he first saw the case it looked as though there were a constricting band, but none was found on examining the specimen more closely. The woman was sick in the hospital for three weeks before her death, but she presented no symptoms whatever indicative of any intestinal abnormality.

DR. H. J. BOLDT presented a specimen of

ADENOMA OF THE OVARY.

The patient, a woman in middle life, had suffered from pain about two years. Microscopical examination of the enlarged gland shows it to be in a state of adenomatous degeneration.

A second specimen was one of

FIBRO-MYOMA OF THE UTERUS.

It was impossible to enucleate the tumor, and in consequence the uterus was removed with it by the supra-vaginal method, and intra-peritoneal treatment of the stump was carried out.

GONORRHEAL SALPINGITIS.

The specimen was removed from a woman who had been infected with gonorrhœa by her husband six months previously. Two months after the beginning of the trouble the left tube was found to be enlarged. No benefit was derived from the treatment employed, and the intense pain incapacitated her from attending to her household duties. Examination showed the uterus to be embedded in a mass of exudation. On opening the abdomen the tube was enucleated with great difficulty from the perimetrical adhesions. The tube was enlarged, but apparently contained no pus, and on cutting into it before removal none escaped. The enlargement seemed to be due to interstitial inflammation.

The tube was, however, removed, because in case of suturing the wound the lumen might be permanently occluded, or, in the event of the sutures giving way, some of the products of gonorrhoeal inflammation might escape into the peritoneal cavity. The opposite ovary was also diseased, having on its surface some small cysts; these were excised after Schroeder's method, which would allow the patient to continue in her generative functions. The three cases above reported made a good recovery.

In addition, Dr. Boldt said he desired to mention another case of rupture of a pyo-salpinx, successfully operated upon by his colleague, Dr. Von Ramdohr, a few hours after occurrence of the rupture, which took place during the night, necessitating operation at 3 A.M. His patient also made a good recovery.

LYMPH NODES AND LYMPH NODULES.

DR. T. M. PRUDDEN referred to the new nomenclature in regard to the so-called lymphatic glands, and said that the Society might do much to promote its general adoption if the individual members would employ it. The so-called lymphatic glands are not glands at all, and should be called lymph nodes. There are other collections of lymph tissue, scattered about in various organs, which differ from the nodes in their small size, and in the fact that they are not distinct one from another and surrounded by a capsule, as are the nodes. These should be called lymph nodules. Then the term gland could be used where it belonged, and much confusion might be avoided. It was also a misnomer to apply the term solitary and aggregated follicles to the collections of lymph tissue in the intestine. He hoped that the members of the Society would help along by the influence of their example the general adoption of this correct nomenclature.

The Society then went into executive session.

Stated Meeting, May 22, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. H. J. BOLDT presented a specimen of

PERFORATION OF THE VERMIFORM APPENDIX.

The patient, nine years of age, had, according to the history given, always enjoyed good health until the night of May 6th. He was seen early on the 7th, complaining only of diarrhoea, and had some vomiting; no pain. Examination, however, showed tenderness and tumefaction in the right iliac fossa. The diagnosis of perityphlitis and typhlitis was made. Ice-bags were applied, proper diet ordered, etc. The child had done very well under treatment, and was thought to be out of danger, both temperature and pulse having reached a normal point by the 10th. About noon, though, the patient experienced a sudden pain, radiating over the whole abdomen. When seen several hours later he presented the characteristic picture of one suffering from perforative peritonitis, the diagnosis of which was made, and it was assumed that a perforation of the appendix took place at the time when the pain was felt. He then seemed in fair condition for operation, yet by the time that preparations for such were made, collapse was so marked that it was desisted from, and the patient died a few hours subsequently. The autopsy showed the peritonitis to be very recent, and the perforation to be due to fecal concretions. The portion of appendix in the vicinity of the perforation was gangrenous. The pelvis contained pus.

The interesting features are that apparently the case was progressing so very favorably, and that it sank so rapidly after occurrence of the perforation. Although the history did not elicit any previous symptoms, yet the speaker was confident that all these cases have had them, and they were left unnoticed. The majority of cases will go to a favorable termination, without operative interference, by proper treatment, consisting of rest, the ice-bag, and diet. Medication is seldom required; yet one should be on the alert, when having such a patient in charge, to be ready for operation should necessity require it.

Dr. Boldt had seen in the same patients several attacks of perityphlitis and typhlitis in the course of two years, and then finally a perforation of the appendix occur which terminated fatally. Such cases are not unusual.

DR. C. N. DOWD said that the case just related re-

called one that he saw about a year ago in one of the house-staff of Roosevelt Hospital. He suffered for about three weeks from symptoms of intestinal trouble, and then signs of perityphlitis appeared. About a pint of pus was found in the pelvis, and there was complete perforation. The vermiform appendix was gangrenous, and the appearances presented were as though there had been a strangulation.

DR. VAN SANTVOORD said that Mr. Frederick Treves had found evidence of previous inflammation of the vermiform appendix in about one-third of the autopsies made by him. This would seem to show that many people have trouble in or near the vermiform appendix at some period of their lives.

THE PRESIDENT asked Dr. Boldt what premonitory symptoms he had observed.

DR. BOLDT replied that there were occasional attacks of pain lasting for four or five days, then passing away, and recurring at intervals of a few days. Constipation was also present.

DR. S. T. ARMSTRONG asked whether the experience of the members of the Society was in accord with that of Mr. Treves. He had had only two cases of perityphlitis in a hospital experience of eleven years, and it had been rare in his experience to find evidences at autopsy of past inflammation in the region of the vermiform appendix.

DR. H. P. LOOMIS said that during the last four years he had taken special note of the condition of the vermiform appendix in all autopsies made by him, and in only a very small proportion of cases had he found evidences of old trouble in that region.

THE PRESIDENT said that he had recently followed a case of perityphlitis in a very young patient. There was a tumor over the cæcum, which subsequently passed away. Pus was found on exploratory puncture. He was wondering whether they ought to be on the lookout for future trouble in this case.

SUPPOSED ULCER OF THE BLADDER.

DR. ARMSTRONG presented a bladder, removed from the body of a man on whom suprapubic cystotomy had been performed in the early part of last September. The patient was admitted to hospital for haematuria following a gonorrhœa. An examination with the cystoscope showed what was supposed to be an ulcer in the wall of the bladder; but when the bladder was opened by the suprapubic operation the spot was found not to be an ulcer but simply a furrow in the mucous membrane. The hemorrhage came from the kidney.

Dr. Armstrong then presented a second specimen showing

ANEURISM OF THE AORTA WITH EROSION OF THE TRACHEA.

The patient was admitted to the Marine Hospital with a diagnosis of Bright's disease and pulmonary tuberculosis. He had had pneumonia four years ago, and dated his present illness from that time. In March of this year he was suddenly seized with a violent hemorrhage, and died instantly. At the autopsy old pleuritic adhesions were found. Arising from the ascending portion of the arch of the aorta was a sac containing fibrin. It had produced ulceration of the trachea, but the opening had been completely closed by a clot. A subsequent erosion of the bronchus had caused the hemorrhage from which death resulted. The aneurism had not been diagnosticated during life. This was the second case of rupture of an aneurism which had occurred in the hospital within six months.

DR. L. H. SAYRE presented a portion of a child's tibia and some slides for microscopical examination showing the lesions of

RAREFYING OSTEITIS.

The specimens were removed by operation from the leg of a child, nine years of age. The child was born of healthy parentage, at the seventh month. When three years of age the patient sustained a fracture of the right tibia, at the middle third, while he was being jumped on the floor. The fragments united at a sharp angle, and the bone was subsequently refractured, and an apparatus making pressure over the seat of deformity was applied, which caused ulceration at this point. The child was brought to New York in order to have what was supposed to be a lateral twisting of the tibia straightened. Examination revealed an enlargement of the leg in which there was an obscure sense of fluctuation. An exploratory incision was made over this enlarged part, and the bone was found to be very much softened. A small piece was removed with a trephine and presented the appearance of a malignant growth. It was sent to a microscopist for examination, and the first report from him was that it was a giant-cell sarcoma; but just before the time set for operation he made another report saying that he was not certain of its malignant character. Dr. Sayre excised the tibia about ten days ago, and the child has done very well since the operation. The speaker was of the opinion that the case was one of osteomyelitis followed by rarefying osteitis. He asked that the specimens be referred to the Committee on Microscopy for examination.

DR. VAN GIESON, from this committee, subsequently

reported that the specimens showed the lesions of rarefying osteitis.

Dr. Van Gieson then demonstrated a

MEYNERT'S BASAL SECTION OF THE BRAIN,

and also presented a card specimen of empyema, in which there was a heart-shaped

UNILOCULAR EMPYEMIC SAC,

weighing nine hundred and fifty grammes, filling the lower right pleural cavity.

DR. WM. P. NORTHRUP presented a specimen illustrating

SCORBUTUS IN AN INFANT.

The patient was a female child, eighteen months of age. One month before death the right leg and knee became swollen and tender. Temperature was 101° F. After two days the symptoms disappeared.

Two weeks before death the child began to seem sick; her gums were swollen and blackened, and bled freely. Two days later her left eyelid became black and swollen—temperature still 101° F. One week before death her pulse became 160 per minute, respirations 50, temperature 103° F., and physical signs of pneumonia developed. At this time her right eyelid showed ecchymosis, and there was marked swelling of the left thigh. During the remaining days of life her passages became black and pasty; the child was very anaemic, failed rapidly under symptoms of pneumonia, and died. No other ecchymoses were seen, and no evidences of syphilis. Child was wet-nursed the first sixteen months of life, but on account of impaired nutrition was taken from the breast and was also given vegetable acids.

For a full description of the cases of which this is a typical example, see Eustace Smith's "Diseases of Children."

Autopsy.—Child well nourished. Left thigh symmetrically enlarged and larger than right, though both seemed disproportionately large. Left femur was normal at its upper extremity, epiphysis, and end of shaft; but the lower remaining portion was invested all about with a layer of black clotted blood, having a uniform thickness of 2 to 3 mm. This lay between the bone and its periosteum. The lower epiphysis was separated, and the end of the shaft eroded and softened. A similar dark layer, though less thick, separated the periosteum from the right femur. Right and left tibiae were surrounded by a thin, dark, hemorrhagic zone beneath the periosteum, and the shafts of these bones at their upper ends and the lower end of the right femur were congested

(as seen on section). The fibulae and bones of the arms and forearms not affected. Brain was normal. Lungs : extensive pleuro-pneumonia of left side, lobar in character —lower and upper lobes; right, extensive bronchitis and scattered masses of hepatization. No hemorrhage in these organs, liver, spleen, nor kidneys.

Microscopic examination of the bone showed no syphilitic lesion to be present, and that the blood zone about the shaft was extravasation, without signs of active inflammation. There was softening and disintegration, but no suppuration in the cancellous bone-tissue. There was moderate congestion at the epiphyseal junctions ; in one only was there softening and separation.

Dr. Northrup also presented a card specimen illustrating

DIPHTHERIA, GENERAL TUBERCULOSIS, AND PNEUMONIA.

At the autopsy the child was seen to be poorly nourished. Extensive and abundant pseudo-membrane from the tip of the nares to the beginning of the trachea, also in the oesophagus and stomach. Mediastinal and bronchial lymph-nodes very much enlarged, many cheesy, some diffuent, some containing discrete tubercles. Lungs thickly studded with discrete miliary tubercles ; lower lobes consolidated, recent hepatization. Liver, spleen, kidneys, contained tubercles. Left kidney arrested in development, about one-fourth its normal size, its companion being correspondingly enlarged ; ureter dilated. No obstruction found, and no lesion to account for the arrested development. Bladder normal.

DR. VAN SANTVOORD said that Dr. Northrup's case recalled one of his own, presented to the Society September 27, 1882. It was that of a helpless idiot, six years of age, in whom extensive hemorrhage, with separation of both upper epiphyses, had occurred under the periosteum of the upper halves of both humeri. This hemorrhage was apparently the immediate cause of death. The case was regarded by him at the time as probably traumatic. Reports that he had subsequently seen of extensive subperiosteal hemorrhage with epiphyseal separations had been regarded by their recorders as scorbutic. He had become convinced that his own case belonged under that heading. In Dr. Northrup's case the condition of the gums seemed conclusive as to the existence of scurvy.

DR. G. C. FREEBORN presented a specimen of

COLLOID CARCINOMA OF THE GLUTEAL REGION.

The patient, a woman, aged sixty-seven, was admitted to the New York Cancer Hospital, April 28, 1888, giving the

following history : About five years ago she fell backward while alighting from a street-car, striking on her hip. No bones were broken. She was under treatment for ten weeks. Two years after the fall a tumor was removed from the region of the sacrum and pronounced sarcoma. Four weeks after the operation she was seized with severe pain over the site of the tumor, and shortly after she noticed that the tumor was growing again. At the time of her admission to the hospital a tumor was found in the left gluteal region. It extended from a point five inches posterior to the anterior inferior spine of the ilium, horizontally, eleven inches to the region of the sacrum. The upper border corresponded to a line on the level of the crest of the ilium, and measured, from above downward, twelve inches. There was an elastic feeling to the mass, especially in the posterior portion near the median line. The skin was adherent over the greater part of the tumor.

On June 20th it was noticed that the tumor was growing into the pelvic cavity.

On July 23d the tumor had extended to the right gluteal region, had encroached to a considerable extent on the pelvic cavity. From this time to December 14th, when the patient died, the tumor grew rapidly, both externally and internally.

Autopsy.—A large, irregular-shaped mass is found occupying the gluteal region ; it extends from a point one and one-half inch above the crest of the ilium, downward, for a distance of twelve inches. On the left side it is even with the outer aspect of the thigh ; on the right side it extends downward on the outer aspect of the thigh, as an irregular oval mass, as far as the middle third. Numerous oval elevations of various sizes extend over the posterior surface of the tumor.

On section through the median line the cut surface measures 23 ctm. in the vertical diameter, and 15 ctm. in the antero-posterior. The tumor is found to be made up of dense tissue in which numerous cyst-like cavities are found filled with a gelatinous material. All the bones of the sacrum up to the first vertebra are destroyed, though their outlines can be made out in the tumor mass. The rectum, uterus, and bladder are pushed well forward against the pubes. The inguinal lymph nodes on both sides are enlarged. No secondary deposits were found in any of the organs.

Microscopical examination shows the new-growth to be colloid carcinoma.

The Society then went into executive session.

Stated Meeting, June 12, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

REPORT OF THE COMMITTEE ON MICROSCOPY.

DRS. HENRY P. LOOMIS and IRA J. VAN GIESON, the Committee on Microscopy, reported that the microscopic section referred to them at the last meeting of the Society, which was obtained from the bone presented by Dr. Lewis H. Sayre, was found to be filled with dilated and irregularly shaped medullary spaces encroaching upon the bony trabeculae. In the semicircular depressions at the margin of the trabeculae were seen granular-looking, multi-nucleated cells (osteoclasts). In some places these cells were almost surrounded by bone. The committee diagnosed the lesion as that of rarefying osteitis.

DR. WILLIAM P. NORTHRUP presented specimens illustrating

GENERAL TUBERCULOSIS — THROMBOSIS OF THE LEFT MIDDLE CEREBRAL ARTERY—CHEESY MASSES IN THE MEDULLA.

A male child aged five months was, when first seen by the house physician, lying in bed in the attitude of a boxer. The head was markedly retracted and turned to the left, the left elbow was raised to the level of the shoulder, the forearm flexed on the arm and held in a plane on a level with the elbow, the hand clinched with the thumb in the palm. The right arm was extended on the level of the shoulder and its fingers clinched over the thumb. The knees were moderately drawn up. Nothing pictures the position better than to imagine the child on its feet in the attitude of a boxer. The abdomen was distended but not tense. Sensations were normal. Respiration was of the Cheyne-Stokes character; pulse rapid and weak; temperature, 99.5°; lungs normal; tache cérébrale marked; cry not meningeal; pupils dilated but not reacting. The child died three days after the first recorded observations.

Autopsy.—Body emaciated. Attitude the same as described above. *Brain:* Tubercles sprinkled over whole cerebrum, thickest along the course of the vessels. About the left middle cerebral artery, in its first inch and a half, was a mass made up of tubercle tissue and inflammatory exudation. The artery was blocked by a thrombus and the brain-tissue to which it was distributed was diffluent, while the remaining and surrounding substance was firm.

The diffuent mass left an opening into the left ventricle. The ventricles seemed not to be dilated, or only moderately. In the wall of the fourth ventricle, at the junction of the medulla and pons, was a yellowish, spherical cheesy mass, about four millimetres in diameter. A similar mass, though smaller, was found lower down in the opposite wall. The spinal cord was normal. *Lungs*: Tubercles large, opaque, and abundant; cavity of capacity of 3 ss. Bronchial lymph-nodes enlarged and cheesy; no pneumonia. *Liver* enlarged, tubercles numerous. Gall-ducts thickened and tubercular. Heart normal. Mesenteric glands large and cheesy. Peyer's plaques swollen, but no ulcers.

Dr. Northrup presented a second specimen, illustrating

ABSCESS OF THE SCALP FOLLOWED BY THROMBOSIS OF
THE LONGITUDINAL SINUS, AND PYÆMIC ABSCESSSES IN
THE BRAIN AND LUNGS IN AN INFANT.

The patient was a male child, two months and six days of age, who was brought to notice with an abscess of the scalp, over the vertex; no history of injury. Three days later, and two weeks before death, he became restless, fontanelles depressed, temperature gradually increasing to 103° F., with twitching of the left arm and jaw, and rolling of the head. He gradually failed, developing in the last days of life an ulcer on the tip of the tongue; fine râles over both chests, and became pale, stupid, and aphonic.

Autopsy.—Extremely emaciated; abscess over vertex nearly healed; beneath the site of the abscess the bone was reddened; the longitudinal sinus contained a firm old clot two and a half inches long, having its middle just below the centre of the abscess. Slight redness of the dura mater; no exudation upon its surface. The wall of the sinus seemed normal; across its cavity stretched a fine bifurcated filament. This was located in the middle of the clot; its tissue was normal. *Brain*: The right lateral surface contained six or eight small abscesses varying in size up to a diameter of from three to four millimetres. These extended inward from the pia mater and were fusiform in shape; the contents, fluid creamy pus. There was no meningitis. Post-mortem softening was advanced. *Lungs*: Scattered broncho-pneumonia with marked infiltration of the small bronchial walls. On the surface of the right lung, just under the pleura, was a small abscess similar to those of the brain. There were no other abscesses found. The thrombus of the longitudinal sinus, the small abscesses of the brain, and the abscess of the lung showed abundant colonies of streptococci. Numerous colonies were distributed in the lungs with evident beginning of abscesses.

Dr. Northrup presented a card-specimen of

VEIN TUBERCLE,

from a case of discrete miliary tuberculosis of the lung in a child. The specimen was of unusual interest from the fact that a fortunate cut across one vein had passed through two tubercles growing from the inner surface of the same vessel. A second microscope slide showed the two tubercles stained for tubercle bacilli, in which the micro-organisms were distinctly demonstrated. The tubercles were of typical structure, containing granular giant-cells and tubercle bacilli.

DR. JOHN S. ELY presented a specimen of

TUBERCULOSIS OF AN ARTERY,

illustrating one of the modes of dissemination of tubercle bacilli in the body.

Even before the discovery of the tubercle bacillus, in 1882, considerable attention had been directed to endeavors to explain the mode of dissemination of the supposed poison of tuberculosis throughout the body. Belief in organized specific virus as the probable cause of infectious disease had been steadily growing since the study by Davaine of the bacillus of anthrax, and in 1878 this belief received most substantial support from the investigation of Koch into the nature of the infectious diseases of wounds. It is therefore quite natural that many investigators should have been at work upon the various problems connected with the etiology of tuberculosis, most of them imbued with belief in the existence of some specific organism as its exciting cause. As has been said, one of these problems had to do with the mode of dissemination of the virus in the body, more especially in cases of acute miliary tuberculosis. The fact that, even before the discovery of the specific virus, a rational and accurate description of at least one way in which this may occur had been offered, is striking demonstration of the usefulness of careful study of the lesions of the infectious diseases, even though for a time all attempts to discover their specific micro-organisms may be vain. Let us hastily glance at some of the more important steps in the proof that, in most cases of acute miliary tuberculosis, it is through the medium of the circulation that the infectious material finds dissemination.

In 1879 it was shown by Mügge¹ that in acute miliary tuberculosis of the lungs it was not uncommon to find miliary tubercles on the intima of small veins in the lung. In nine out of ten cases examined, he succeeded in de-

¹ Mügge, F.: Ueber das Verhalten der Blutgefässe der Lunge bei disseminirter Tuberculose. Virchow's Archiv, lxxvi. (1879), 243.

monstrating their presence. During the same year Weigert¹ published reports of three cases of acute miliary tuberculosis, in which old foci of tubercular inflammation which had undergone cheesy degeneration were found to have extended to large veins at the root of the lungs, setting up in them tubercular phlebitis. He drew attention to the ease with which large quantities of cheesy matter might, in such cases, find entrance into the circulation. The next year, in the study of a case of tubercular meningitis, Cornil² observed small tubercles in the intima of many of the meningeal vessels; and a little later, Kiener³ repeated this observation in the case of other serous membranes. In 1882, only a short time before the publication of Koch's discovery, Weigert⁴ added a series of most instructive cases to those published in 1879, in which he found abundant substantiation of the conclusions then drawn. In six of the cases acute miliary tuberculosis was shown to have resulted from infection of the blood from large vein-tubercles, and in two cases the thoracic duct was found to have been the point of entrance of the virus into the circulation. In both of these Weigert was able to discover small tubercles on the intima of veins in various parts of the lungs. The next year he⁵ reported the finding of tubercle bacilli in the lesions of all these cases.

In 1883 we begin to have accounts of the finding of tubercle bacilli in the blood. The first of these we owe, I believe, to Babes and Cornil.⁶ In 1884 similar observations were made by Weichselbaum⁷ in three cases of acute miliary tuberculosis. The same year Lustig⁸ applied the knowledge gained from these investigations to diagnostic uses, finding tubercle bacilli during life in the blood of a patient in whom the diagnosis of acute miliary tuberculosis had been suspected, but could not otherwise

¹ Weigert, C.: Zur Lehre von der Tuberkulose und verwandten Erkrankungen. *Virchow's Archiv*, lxxvii. (1879), 269.

² Cornil, V.: Contributions à l'étude de la tuberculose. *Journal de l'anat. et de la physiol.*, xvi. (1880), 313.

³ Kiener: De la Tuberculose dans les séreuses chez l'homme et chez les Animaux inoculés. *Archiv. de Physiol. norm. et path.*, 2me Série, vii., 790 and 894.

⁴ Weigert, C.: Ueber Venentuberkel und ihre Beziehungen zur tuberkulösen Blutinfection. *Virchow's Archiv*, lxxxviii. (1882), 307.

⁵ Weigert, C.: Die Wege des Tuberkelgastes zu den serösen Hhäuten. *Deutsche med. Woch.*, 1883, No. 24, p. 453.

⁶ Babes et Cornil: Note sur les Bacilles de la Tuberculose et sur leur Topographie dans les Tissus altérés par cette maladie. *Arch. de physiol. norm. et path.*, 1883, p. 456. Babes: Der erste Nachweis der Tuberkelbacillen in Gefäßen und deren Anwendung. *Deutsche med. Woch.*, 1883, p. 514.

⁷ Weichselbaum: Ueber Tuberkelbacillen im Blute bei allgemeiner Miliartuberculose. *Anzeiger d. Ges. Wiener Aerzte*, 1884, No. 19.

⁸ Lustig, A.: Ueber Tuberkelbacillen im Blute bei an allgemeiner acuter Miliartuberculose Erkrankten. *Wiener med. Woch.*, 1884, No. 48.

be proved. In 1885 these observations were confirmed by Ulacacis,¹ Sticker,² Rütimeyer,³ and Doutrelepoint.⁴

Up to the time of which we are speaking, it was as the result of involvement of veins, more especially, that infection of the blood was supposed to occur. In 1886 Weigert⁵ showed that this is by no means always the



FIG. 3.—Tubercular Arteritis, the Result of the Encroachment of an Area of Tubercular Inflammation upon an Artery in the Lung. (From Delafield and Prudden's "Handbook of Pathological Anatomy.")

case; that arteries are often seriously compromised by surrounding tubercular masses. He reported at the same time the case of a child, four years of age, in whom this

¹ Ulacacis, G.: Sulla presenza del bacillo tubercolare nel sangue. *Gaz. degli ospidali*, 1885, No. 25; *Centralbl. f. klin. Med.*, 1885, No. 30, p. 517.

² Sticker, G.: Ueber das Vorkommen von Tuberkelbacillen im Blute bei der acuten Miliartuberculose. *Centralbl. f. klin. Med.*, 1885, No. 26, p. 441.

³ Rütimeyer, L.: Ueber das Vorkommen von Tuberkelbacillen im Blute und Milzsaft bei allgemeiner acuter Miliartuberculose. *Centralbl. f. klin. Med.*, 1885, No. 21, p. 353.

⁴ Doutrelepoint: Fall von Meningitis tuberculosa nach Lupus. *Tuberkelbacillen im Blute*. *Deutsche med. Woch.*, 1885, No. 7, p. 98.

⁵ Weigert, C.: Ausgedehnte umschriebene Miliartuberculose in grossen offenen Lungenarterienästen. *Virchow's Archiv, civ.* (1886), 31.

had led to the production of acute miliary tuberculosis. He was almost immediately confirmed in this by Nasse¹ and Durand-Fardel,² both of whom found, in addition, miliary tubercles on the intima of small arteries in the kidneys.

Tubercular endocarditis was described during the same year by Heller,³ in a paper read before the Congress of German Naturalists and Physicians at Berlin.

This, then, completes the proof, for these observations have been repeatedly confirmed. We have seen that veins, arteries, and thoracic duct have been observed to be involved in masses of tubercular tissue; that miliary tubercles have been found in the intima of veins and arteries throughout the body, and in the endocardium; that these lesions have all been found to contain tubercle bacilli; and, lastly, that tubercle bacilli have been found in

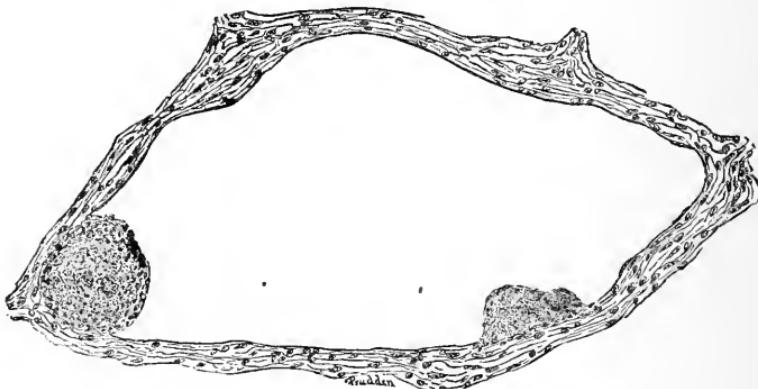


FIG. 4.—Dr. Northrup's Specimen illustrating Vein Tuberclie.

the blood in cases of acute miliary tuberculosis, both during life and after death.

The specimen which I present to-night illustrates one of the modes in which infection of the blood may occur. It is a section of the upper lobe of the left lung of a child who died of acute miliary tuberculosis. Autopsy revealed very large and cheesy bronchial glands, and scattered through both lungs were many miliary and sub-miliary tubercles. At the apices and in the vicinity of the bronchial glands cheesy masses of conglomerate tubercle were found. But what is of especial interest is the

¹ Nasse, D.: Beiträge zur Kenntniss der Arterientuberkulose. Virchow's Archiv, cv. (1886), 173.

² Durand-Fardel, R.: Les Bacilles dans la Tuberculose miliaire. Tuberculose glomérulaire du Rein. Arch. de Physiol. norm. et path., 1886, No. 4, p. 393.

³ Heller: Ueber tuberkulöse Endocarditis. Tagebl. d. 59 Ver-samml. deutscher Naturforscher und Aerzte zu Berlin, 1886, p. 420.

encroachment of many of the tubercles upon the walls of blood-vessels. In places the walls of veins are affected ; in others those of arteries. The most beautiful of these, and the one to which I desire to direct attention more especially, is a small artery near the base of the upper lobe, which is encroached upon by a miliary tubercle immediately adjoining it, and in which a tubercular arteritis is seen. The wall of this vessel is infiltrated with small round cells, and, projecting into its lumen, and partially occluding it, is a mass of small round cells, in the centre of which cheesy matter is distinctly visible. It will readily be appreciated how slight a variation in arterial pressure might be sufficient to cause this degenerating mass to be thrown into the circulation, and carried by it to any part of the body. The accompanying drawing (Fig. 3), made from the specimen by Dr. Prudden, represents the condition which I have endeavored to describe.

Tubercle bacilli have been found in these lesions in other sections from the same lung.

In conjunction with the specimen of tubercles in a vein just presented by Dr. Northrup, these specimens are an interesting corroboration of the theory whose development I have endeavored to trace ; the first (Dr. Northrup's, Fig. 4) showing the effect produced by the lodgement of tubercle bacilli on the intima of a vein, one of the ways in which they may have entered the blood-current being exemplified by the second.

The Society then went into executive session.

Stated Meeting, October 9, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. EUGENE HODENPYL presented a specimen showing
HEMORRHAGE INTO THE RIGHT VENTRICLE.

The brain was removed from the body of a middle-aged man, who fell while walking in the street, and by the time the ambulance reached him he was unconscious. At the autopsy the speaker found a blood-clot in the right lateral ventricle, while the left lateral and the third and fourth ventricles were distended with a bloody fluid. The blood-vessels at the base of the brain were normal, and there was neither heart nor kidney disease.

A second specimen shown was one of

CALCIFICATION OF THE MITRAL VALVE.

The heart was removed from the body of a young man who had been in hospital under treatment for cardiac disease. He died suddenly, and at the autopsy, in addition to adherent pericardium, there was found an enormous calcification of the mitral valve, occasioning very marked stenosis.

A third specimen was presented of

CARCINOMA OF THE MALE MAMMA.

The tumor was removed by Dr. Hartley, from a man seventy-three years of age, who had noticed the presence of the growth for several years. The axillary glands were also removed. The tumor was about one-half by two inches in size. The patient made a good recovery, and is well at the present time. The axillary glands showed no lesions except hyperplasia.

DR. PRUDDEN asked if there was anything peculiar in the structure of the new-growth last presented.

DR. HODENPYL said that there was not. It was an ordinary alveolar carcinoma.

THE PRESIDENT asked whether there was any history in the case of valvular disease. The stenosis was so great that one would suppose the symptoms must have been very marked.

DR. HODENPYL replied that the presence of a mitral lesion had been diagnosticated, but the history contained nothing of special interest.

DR. G. C. FREEBORN demonstrated some

IMPROVEMENTS IN ACCESSORY APPARATUS.

The first was a modification by Arnold of the clamp in Thomas's microtome, as a result of which the level of the specimen could be adjusted with much greater accuracy.

The second was an iris diaphragm for use with the Abbé condenser. By means of this diaphragm the amount of light admitted could be regulated with the greatest ease by simply turning a milled head, and it could be very gradually increased or diminished, instead of being changed suddenly as in the old style of diaphragms with a series of holes.

DR. PRUDDEN remarked that the special advantage of the diaphragm was that it was all in nearly the same plane, and it was on this account much better than the ordinary conical iris diaphragm.

DR. MESSENGER asked whether the improvement could be applied to any microscope having an Abbé condenser.

DR. FREEBORN said that it could, with some slight modifications, be attached to any instrument. In reply to a question as to its durability, he said that he had had the diaphragm a short time only and could not therefore say how long it would last.

DR. J. S. ELY said that he had had one in use for a considerable time, and he thought that with care it was very durable.

DR. H. M. BIGGS presented a microscope slide showing

WEIGERT'S NEW STAIN FOR NEUROGLIA TISSUE.

The formula, he understood, had been published very recently, but he had not seen the details of the preparation of the stain.

DR. FRANK FERGUSON presented a microscope slide showing

ENCYSTED TRICHINÆ.

A boy, aged six years, was taken to the Long Island College Hospital, four years ago, for the treatment of a lump in the lumbar region. Incision revealed only muscular and fibrous tissues. A small fragment was taken from the edge of the wound and examined microscopically when numerous trichinæ were seen in each section. Each parasite was rolled up within a hyaline capsule. The muscular tissue was generally destroyed, and replaced by fibrous tissue rich in inflammatory corpuscles. The boy was taken away from the hospital, by his parents, before any history could be obtained.

Another microscope slide showed an

ECHINOCOCCUS CYST OF THE LIVER.

The entire cyst had been excised, and the section showed vast numbers of echinococci and hooklets. The tissue adjacent to the cyst was inflamed.

Dr. Ferguson then presented specimens showing

HYPERTROPHIC CIRRHOSIS OF THE LIVER, AND CHRONIC
DIFFUSE NEPHRITIS,

removed from the body of a man, thirty-eight years of age, a merchant by occupation, and addicted to the rather free use of alcoholic liquors. He had had rheumatism twelve years ago, but gave no history of syphilitic or malarial infection. Three weeks before admission to hospital he noticed that his skin was growing yellow, and he suffered from anorexia and nausea. He complained of constant thirst, but had no pain and no itching, although the jaundice became very pronounced. The area of hepatic dulness was very greatly enlarged, extending vertically from the fifth rib to within one inch of the anterior superior spine of the ilium, and laterally almost to the umbilicus. The urine was red in color, but clear, alkaline, sp. gr. 1.012, contained a trace of albumin, hyaline casts, and much bile pigment. He died in about two weeks after admission to the hospital, the liver having in the meanwhile decreased about two inches in its vertical diameter.

At the autopsy the liver was found to weigh 3,800 grammes, was deeply bile-stained, and contained a large amount of new fibrous tissue. The kidneys were enlarged, with indistinct markings; the pyramids were of a green color, while the cortex was yellowish. The spleen was enlarged, measuring $10\frac{1}{2} \times 6 \times 2\frac{1}{2}$ inches, was dark in color and firm in consistency, and scattered throughout its substance were numerous small nodules with cheesy centres. The common bile-duct was filled with mucus, and to this fact the speaker was inclined to attribute the very marked jaundice present.

The Society then went into executive session.

Stated Meeting, October 25, 1889.

H. M. BIGGS, M.D., VICE-PRESIDENT, IN THE CHAIR.

DR. H. P. LOOMIS presented a specimen of

NECROSIS OF THE PANCREAS.

J. E.—, aged forty, of about two hundred and ten pounds in weight, who had been drinking hard for three months, was admitted to Bellevue Hospital, apparently suffering from the effects of his debauch. For two weeks previous to his admission he had a diarrhoea, during which his stools were at times streaked with blood. No history of any previous illness was obtainable.

On admission the patient was mildly delirious. His stools were of a light yellow color, containing small masses of fecal accumulations surrounded by mucus which was streaked with blood. His temperature was normal, and his pulse was rapid but regular. His condition did not warrant a grave prognosis, but seven hours after admission he suddenly went into a state of collapse, and died from heart failure.

The autopsy was made twenty hours after death. The body presented all the appearances of general obesity. The lungs were normal, and the heart appeared normal, although the microscope revealed fatty infiltration of its muscle fibres. The spleen was normal. The liver showed excessive fatty infiltration, and there was moderate degeneration of the epithelial cells of the uriniferous tubes. The intestines, with the exception of congestion of the capillaries in places along the duodenum and ilium, were normal. The pancreas was greatly enlarged, measuring eight inches in length, two and one-half inches in breadth, one and one-eighth inch in thickness, and it weighed twice as much as normal (eight ounces). The pancreatic duct was pervious. Projecting from the surface, and better seen on opening the organ, were greenish-white areas, varying from the size of a pin's head to that of a large olive. The large areas presented a gangrenous appearance, but were dense and contained no fluid. Between these necrotic-looking areas the substance of the pancreas appeared normal.

Microscopical examination showed that the gangrenous-looking masses were areas of coagulation necrosis surrounded by normal tissue. In some of the areas faint outlines of the pancreatic tissue could be made out; in other areas were seen coagulated fibrin and some granular material. From an examination of a number

of sections, the most probable explanation of the cause of the necrotic masses in the pancreas was that they were the result of previous hemorrhages into the substance of the organ.

DR. L. EMMET HOLT presented specimens from a case of

ACUTE BRONCHO-PNEUMONIA, WITH OBSCURE SYMPTOMS
AND LATE DEVELOPMENT OF PHYSICAL SIGNS.

The patient, an inmate of the New York Infant Asylum, was a female child, fifteen months old, and died on the seventeenth day of the disease.

During the first week, with a steadily high temperature reaching nearly 105° F. every day, the respirations were only 40 per minute; there was no cough, and repeated examinations of the chest revealed no signs of disease. In the second week the respirations rose to 70 per minute, and varied between 50 and 70 until death. There were now present a few fine râles over both lungs posteriorly, but never any signs of consolidation.

There was mild diarrhea throughout the disease.

The autopsy showed small spots of broncho-pneumonia widely diffused throughout both lungs, but no large areas of complete consolidation. In the anterior border of the left upper lobe was an area, about the size of a hen's egg, completely hepatized and resembling in gross appearance lobar pneumonia. In this were one or two small abscesses one-quarter inch in diameter, and a small, wedge-shaped spot of gangrene, with the base at the surface of the lung. This communicated with a small bronchus, but no obstruction could be discovered either in the bronchus or pulmonary vessels. The intestines showed moderate colitis, other organs essentially normal.

The principal interest of the case lay in some of its clinical features.

First, a steadily high temperature, due evidently to pneumonia, the respirations being scarcely above the normal for a week. Secondly, the late appearance of physical signs and their meagreness.

DR. H. S. STEARNS presented

A MINUTE SPLEEN,

removed from the body of a man, aged forty-six, who had died from pulmonary tuberculosis. He was of large size, and had been apparently well nourished. He had suffered from malarial attacks for several years. The spleen was of very small size, measuring only 6.75 ctm. in length by 2.5 ctm. in width and 0.66 ctm. in thickness, and weighing but 5.92 grammes.

DR. H. M. BIGGS showed

A GRAPE-SEED IN THE VERMIFORM APPENDIX.

The appendix contained a small fecal accretion, in the centre of which was found a grape-seed. It was very rare in his experience to find any nucleus in these fecal masses lodging in the appendix.

Dr. Biggs also presented specimens from a case of

TYPHOID FEVER WITHOUT ENLARGEMENT OF MESENTERIC GLANDS.

The patient had been sick, with a temperature running from 104° to 105° F. At the autopsy general peritonitis was found, with perforation of the intestine. There were numbers of very small ulcers just above the ileo-cæcal valve. The mesenteric glands, however, were not enlarged at all. The spleen also was not enlarged, its weight being about one hundred grammes. The case was, nevertheless, undoubtedly one of typhoid fever.

A third specimen was of

INCOMPLETE VENTRICULAR SEPTUM,

discovered at the autopsy of a woman, aged thirty eight, who had died of pulmonary tuberculosis. There was one large opening, about one centimetre in diameter, and in addition a number of small ones. As far as could be learned there had been no symptoms of this condition noted during life.

The last specimen was one showing

INJURY OF THE LARYNX FROM AN ELECTRIC LIGHT WIRE.

The man from whom the specimen was taken was a line-man who had been killed by electricity while repairing some wires on a telegraph pole. One of the wires had come in contact with the face, and sliding down to the mouth had cut into the cheeks. The other had opened the larynx, cutting through the thyroid cartilage and the upper portion of the cricoid, and producing almost complete occlusion of the larynx. At the autopsy of this man, and of others dying from electric shock, the blood was found to be dark and fluid, no clots being found anywhere in the body. Minute hemorrhages were found under the surface of the various serous membranes, and, in addition, there was general congestion of the viscera.

DR. ROOSEVELT said that he had seen many cases of perforation of the vermiform appendix, but had never seen any in which there was anything present except fecal matter.

DR. BIGGS said that this was the third case in which he had found a foreign body as a nucleus of the fecal mass in the appendix. In the first there was a raisin-stem, and in the second an apple-seed.

DR. M. PUTNAM-JACOBI asked whether in these cases of foreign body in the vermiciform appendix there were any peritoneal adhesions drawing open the lumen of the appendix and thus allowing the body to enter.

DR. BIGGS replied that he had seen numerous cases of concretion in the appendix, in which that portion was perfectly normal and where no peritonitis was present.

The Society then went into executive session.

Stated Meeting, November 13, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. H. M. BIGGS presented some specimens showing
TUBERCULOSIS OF VARIOUS ORGANS AND CARCINOMA OF
THE STOMACH.

The patient died from what was supposed to be, and what proved to be, cancer of the stomach. There had been pus in the urine, and there had also been symptoms of vesical trouble, but the exact nature of this disease had not been determined. At the autopsy there was found to be carcinoma of the stomach, the new-growth nearly encircling the pylorus. On removing the right kidney the pelvis and ureter were found to be greatly dilated, and in the lower portion of the kidney was a large cheesy mass, evidently tuberculous in its nature. In the left kidney a similar condition was found, though the lesions seemed to be somewhat more advanced than on the other side. There was greater dilatation of both the pelvis of the kidney and of the ureter on this side. In the bladder was a very large tuberculous ulcer, the size of two silver dollars, which had perforated the wall of the bladder. Around the urethral orifice and at the trigonum were several tuberculous abscesses, and the prostate contained a very large abscess. The lungs did not show any marked tuberculous process. There was pronounced anthracosis in both upper lobes, with an enormous increase in connective tissue, and scattered through both upper lobes, and, to a certain extent, in the lower lobes as well, were small groups of fibroid tubercles. In the intestines, also, were a number of tuberculous ulcers, which were interesting because of the fact that they completely encircled the intestinal wall, and at a number of points had produced considerable stricture of the intestine. This, in the speaker's experience, was an occurrence of considerable rarity.

It is very difficult in these cases, Dr. Biggs said, to determine which is the primary process. In the case here shown there may have been a cheesy process in the lungs from which the disease started, although the appearance of the lesions would seem to point to the genito-urinary tract as the part primarily affected. The combination here shown of general tuberculous lesions and of carcinoma was a very uncommon one.

Dr. Biggs presented a second specimen, showing

SYPHILITIC DISEASE OF THE SKULL.

There was marked thickening of the skull, and an enormously thickened pericranium, and beneath this was

a carious process going on. The bone seemed, at first sight, to be hard, but it was not, as the saw cut into it very easily. The skull was asymmetrical. Thickening of the skull from syphilis was not at all common in the speaker's experience. The pericranium in this instance was nearly three-sixteenths of an inch in thickness. There had been no cerebral symptoms at all. The patient had died from acute lobar pneumonia.

THE PRESIDENT asked the speaker what his opinion was as to the frequency of primary tuberculosis of the genito-urinary tract.

DR. BIGGS replied that it was very difficult in such cases to determine whether the primary process is in the lungs or in the genito-urinary tract, because it is almost impossible to form any conception as to the age of tubercular lesions; there is such a marked tendency sometimes for the process to remain stationary for long periods. There may be a few cheesy masses in the lungs which may remain there with little or no change for years, and yet these may be foci from which are started up, later, extensive tubercular processes in other organs. In the case here shown there may have been some localized tubercular process in the lung which was primary, although the appearance of the lesions, regarding both the extent and apparent duration, would seem to point to the genito-urinary tract as the part primarily affected.

He had long felt that in such cases the probability was largely in favor of the primary process being located in the lungs, and of its forming a focus for secondary deposits in the genito-urinary tract. It was possible to explain development in the genito-urinary tract, then, on the supposition that the tubercle bacilli, having in some way made their way into the circulation, were excreted by the kidneys, and in the process of excretion a local tubercular process was set up either in the kidneys or in some portion of the urinary tract. It is known that after the injection of pyogenic organisms into the blood, they are thrown out in the urine through the kidneys, and foci of suppuration are thus produced in the kidneys, and it seems not improbable that tubercular foci may be produced in the same way. The speaker had never seen a case of genito-urinary tuberculosis without tubercular lesions in other organs, and, although he had formerly regarded some of these cases as primary there, he had now come to consider them as probably secondary, certainly this was usually the case.

It was possible to explain genito-urinary tuberculosis in the female on the supposition that it was transmitted from the male during coitus, where there was tuberculosis of the male genital tract; but this explanation would not

account for the development in the male genital tract. A German observer had shown, however, that in advanced primary tuberculosis, where there were no visible tuberculous lesions in the testicles, there might yet be isolated tubercle bacilli there.

DR. JOHN S. ELY said that Dr. Biggs had mentioned the attempt of the kidneys to excrete the bacilli in the blood, but he had not shown clearly how these organs became infected during that process. The speaker believed that the proneness of these organs to infection could be accounted for in a measure by the fact that the capillaries here and in the glands generally were very fine. In passing through these capillaries the bacilli would run a much greater chance of being caught, and, as a result of such detention, tuberculosis would be set up. During secretion, also, there is an increased amount of blood in the parts, and this offers a further explanation of the greater liability to infection, since with the increased volume of blood there would be a greater number of bacilli brought to the kidneys, and thus the chances of some of them being caught would be correspondingly increased.

THE PRESIDENT said that in his autopsies on tuberculous children he had found the lungs most markedly affected in the vast majority of cases, the bronchial glands being also involved. When the lungs were seen to be pretty well sprinkled with tubercles it was his custom to look at the liver and then at the spleen, these two organs being affected with about uniform frequency. When the disease was very extensive, involving perhaps the peritoneum or mesenteric glands in addition to the liver and spleen, he would then look to the condition of the kidneys with some expectation of finding them diseased. But he would not expect to find these organs affected until the tuberculous tide had risen so high as to engulf almost the entire body.

DR. FISHER asked whether any endarteritis of the cerebral vessels was found in the case of syphilis of the skull. In looking up the subject of cerebral syphilis sometime ago he had seen the statement that when other organs were particularly affected the brain was apt to escape.

DR. BIGGS said that there were some endarteritis present.

DR. JOHN S. ELY presented a number of mummified foetuses, and read a paper on

MUMMIFICATION: ONE OF THE RESULTS OF RETENTION
OF A DEAD FOETUS IN UTERO.

Since careful study began to be accorded to the various phenomena of abortion, death of the foetus has been regarded the most frequent factor in its causation. So

constant is the association of foetal death and expulsion of the contents of the uterus, that in early times it was customary to look upon the retention of a dead foetus as evidence of witchcraft, or of Divine displeasure; and superstitious fear prevented the careful investigation of such cases when they occurred. For about three centuries, however, allusions to the remarkable changes in the foetus consequent upon its retention in utero are to be found in the literature of the subject and have excited the curiosity of medical men the world over. *Lithopædia*, being the most remarkable of these changed products of conception, were naturally the first to receive description. The study of the process of mummification is of comparatively recent date.

The specimens which I have to present this evening are foetuses of about four months growth, which were retained in utero for some time after their death, and which have undergone mummification in varying degrees.

I. The first occurred in the practice of Dr. James J.

Healy, of Newburyport, Mass., by whom it has been presented to the Museum of the College of Physicians and Surgeons (No. 867). The mother, a primipara, passed through her pregnancy to term without untoward symptoms. During labor digital examination disclosed a hard, sharp body, which, to use Dr. Healy's words, "felt like an oyster-shell coming down with the head of a full-grown and well-developed child, the convexity of the head fitting the concavity of the shell, which proved to be the head of the foetus." The body of the foetus is so flat that it was designated by Dr. Healy a "pancake foetus." The head is flattened from side to side, concave

FIG. 5.—Outline Drawing of "Pan-cake Foetus." Front View.



and is turned so as to look almost directly backward. The trunk is flattened obliquely antero-posteriorly, and is at the same time twisted, so that the flattened pelvis lies in a plane almost vertical to the plane of the thorax. The posterior surface of the trunk is concave, the anterior surface convex. The left arm is drawn backward, the right lies across the front of the trunk. The lower extremities are flat, bent at the knees and ankles, and are twisted. The umbilical cord is very

small, but not twisted. The placenta is unfortunately not preserved. The above drawing gives some idea of the distortion of this foetus. I am inclined to attribute the extreme flattening in this case to compression of the mummified foetus by the living twin in the genital passage during delivery.

II. The second specimen is in the collection recently donated by St. Luke's Hospital to the College of Physicians and Surgeons (No. 868). It is unaccompanied by any history, but from its appearance I am led to believe the conception in this case to have been single, not twin, as in the first case. Mummification has not progressed as far, and the body is not much flattened. The cord is very much twisted. Examination of the placenta shows it to be very fatty, and the label on the jar informs us that this was attributable to syphilis.

III. The third example of mummified foetus is from the Museum of the College of Physicians and Surgeons (No. 358). It resembles the others closely in its shrivelled appearance, but shows in addition the deformity of double hare-lip. The thread-like umbilical cord twists around the neck of the foetus.

The curious shrivelled appearance of these mummified foetuses cannot fail to excite curiosity as to the nature and mode of production of such a remarkable change. While its complete explanation may be impossible with our present knowledge, still a number of more or less suggestive facts which seem to bear upon it, are at our disposal, and to some of them I shall ask your attention for a few moments.

It is clear that there can be no mummification of the foetus unless it die and be retained without undergoing putrefaction, and it is hardly to be supposed that such pronounced change in the physical characters of the tissues should occur without concomitant alteration in their chemical composition.

It is quite unnecessary for our purposes to enter into lengthy discussion of the causes of foetal death—these have received much attention in the various text-books of obstetrics. A word, however, regarding the time at which the death of the foetus most frequently occurs may not be out of place, for the similarity in age of the specimens presented can hardly have escaped notice, and may have suggested the question as to whether the age at which foetal death occurs may not have a determining influence on the production of mummification. I am inclined to answer this question in the negative, for although mummification is more frequent in foetuses of about four months' growth, so is foetal death, as is shown by careful statistics of abortion, more than half of all abortions occurring during the

fourth month. What the influences causing death of the foetus during the fourth month are it is difficult to say. The growth of the embryo at that time is very rapid, its dependence for nutrition has recently come to be entirely upon the placenta, which during the third month replaces the chorionic villi, and, furthermore, inherited constitutional vices have had time to develop and produce their destructive effects. There is every reason to believe the incubation period of disease to be the same, whether its victim be still in utero or older, and one would hardly expect the effects of a disease so insidious as syphilis (the cause *par excellence* of foetal death) till after the lapse of several months.

But why should the uterus at times retain a dead foetus when it is usually so prompt in its expulsion? That much obscurity should surround the solution of this problem is not remarkable, considering our absolute inability to offer any satisfactory explanation of the remarkable regularity of the onset of labor at the expiration of ten lunar months of pregnancy. But are we not apt to overestimate the rarity of retention of what may be called foreign bodies in the cavity of the uterus? We not infrequently see retention without expulsive effort of portions of after-birth, of moles of various kinds and of polypi and submucous fibroids. This suggests ability on the part of the uterus to accustom itself to gradual changes in its contents, even though they may be abnormal. We should accordingly expect to have retention of a dead foetus more often in cases where the causes of its death had worked insidiously, gradually bringing about its destruction. Among such may be mentioned disease of the placental vessels, faulty development of the foetus, debilitated state of the mother's health, etc., causes acting to disturb the nutrition of the foetus. Again it should be remembered that many of these processes insidiously affecting the nutrition of the child are apt to lower the vitality of the mother and render her more liable to uterine inertia.

In twin conceptions the retention of a dead foetus until the completed development of the living child appears to be one of those conservative efforts so frequent throughout the animal kingdom, and may be regarded as a survival of one of the necessary efforts on the part of our remote ancestors (whose conceptions were habitually multiple) at preservation of the race, so important a factor in its evolution. The importance of this conservative process is strikingly brought out by comparison of the statistics, for mummification is shown to be about three times as frequent in twin pregnancies as in single.

In connection with the discussion of this problem of

the retention of a dead foetus it is interesting to note the frequent observation of a strong tendency on the part of the uterus to discharge its mummified contents at term, even though the conception may have been single. This is illustrated by numerous cases on record, perhaps the most interesting of which is reported by Skjelderup,¹ who observed twice in the same woman retention of a dead foetus and its discharge at term in both instances.

Long before the discovery of the true nature of the process of putrefaction, non-rupture of the foetal membranes was held to be essential to the preservation of the dead foetus, which was then thought to be due to the pickling of the foetus in the liquor amnii. While not denying the possible influence of immersion in the liquor amnii upon the chemical changes incident to the process of mummification, we are now less inclined to attribute the simple preservation of the foetus to any action of the liquor amnii than to the exclusion of the putrefactive bacteria which is accomplished by the continuity of the membranes.

And this leads us to inquire into the nature of the chemical changes occurring as a part of the process of mummification. I regret to say that but little is known regarding this subject, and, so far as I am able to find, no analysis of the flesh of a human mummified foetus has been made. In 1877, however, Forster² conducted a careful analysis of the flesh of a mummified calf, which had been retained in utero for about four months after its death, and compared the results obtained with those of the analysis of normal calf's muscle. The accompanying table represents his results :

	Fresh mummified calf's muscle in percentages.	Fresh normal calf's muscle in percentages.
Water	75.3	78.2
Solids.....	24.7	21.8
Proteids.....	21.3	20.5
Fats.....	1.43	1.3
Ash	0.75	1.46

From this it would appear that, contrary to our expectation, there is but very slight variation from the normal in the content of water and solids, that, of the latter, the proteids and fats are but slightly changed in relative amounts, but that the ash of the mummified calf's muscle is very considerably less than the normal, only a little

¹ Skjelderup, M.: Retention af et Abortivag til Udlöbet af Svangerskabet med nogle Bemerkninger om Fjarnelsen af en tilbageholdt Abortioplacenta, Tidsskrift for pract. med., 1882, 273. Abstract in Virchow-Hirsch Jahresbericht, 1883, ii., 590.

² Forster, Jos.: Zur Kenntniss der sogenannten Kalbsmumien, Zeitschr. f. Biologie, xiii., 1877, 299.

more than half. Analysis of 100 grammes of ash from each case gave the following result:

	Mummified calf.	Normal calf.
Lime	8.4	2.7
Sodium	19.1	6.8
Potassium	4.3	15.1
	<hr/>	<hr/>
	31.8	24.6

Showing, besides a slight increase in the content of alkaline bases in the ash of the calf's mummy, a curious substitution of sodium salts for potassium and a decided increase in the proportion of lime salts.

Not satisfied with these results as an explanation of the peculiar dry and shrivelled appearance of the mummified flesh, Forster examined another, even more pronounced case of calf's mummy, with a view to the determination of any change in the character of the proteid substances. No marked changes could, however, be detected. A substance closely resembling the myosin of healthy muscle was extracted by means of water, and the proportions of the various other proteid constituents of the muscle were found to be unaltered.

Thus we arrive at the end of our discussion of the subject without being able to draw any very definite conclusion. We have seen that there are reasons for believing the death of the foetus in cases of mummification to occur gradually, as the result, in most cases, of disturbance of the foetal nutrition; we have seen that the very insidiousness of the process causing the death of the foetus in all probability enables the uterus to accommodate itself to the foreign body in its cavity; we have seen the tendency of the uterus to discharge its contents at term persist even in cases where the life of the foetus has been long extinct; and, finally, we have been led to believe that certain chemical changes, at present little understood, lie at the bottom of the decided change in appearance of the mummified foetus.

DR. BIGGS asked whether there was any difference between the mummification of a foetus within the uterus and that occurring in extra-uterine pregnancy.

DR. ELY replied that there was no reason to suppose that there was any difference at the beginning, but calcification was much more common in extra-uterine pregnancy. In answer to a question concerning the significance of the table presented, he said that he thought it was of but little importance except that it showed that there was some chemical change in the process of mummification. But what the exact nature of the process was he was unable to say.

DR. H. S. STEARNS presented a specimen, and a plaster cast made from it by Dr. Byron, of a small

ROUND-CELL SARCOMA OF THE BRAIN.

The only symptoms that the patient had had were a loss of eyesight and an affection of speech. He could only repeat words, and if asked a question he would simply repeat that and not give an intelligent answer. The tumor was lying on both frontal lobes, about two-thirds on the left and one-third on the right. The patient was forty-seven years of age.

DR. FISHER said that it was impossible, from a simple inspection of the specimen, or of the plaster cast made from it, to tell how much of the brain-substance was involved. Apparently the first and second frontal convolutions on both sides were encroached upon. He could not understand how the speech could be affected by a tumor in this situation, except as the result of intra-cranial pressure. The blindness, also, could have been caused only by the general pressure and not directly by the tumor itself.

DR. LINSLEY said that he would like to ask the Society if any of the members had ever seen unstriated muscular tissue in a tumor of the brain. At an autopsy recently made at the Presbyterian Hospital a fibro-sarcoma of the brain was found which contained something that had every appearance of unstriped muscular tissue. It was seen by several pathologists, and they all remarked upon the peculiar appearance of the tissue, but were unable to define its true nature.

The Society then went into executive session.

Stated Meeting, November 27, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. T. M. PRUDDEN presented a specimen of
HEMORRHAGE IN AND ABOUT THE RIGHT SUPRA-RENAL
GLAND IN A NEW-BORN CHILD.

There was no special incident in the delivery of the male child, which, with much difficulty, was made to breathe at first, and continued to breathe badly and poorly perform its general functions until its death on the fifth day.

The abdominal cavity was filled with dark fluid blood or bloody serum, and a large and old clot lay over the region of the right supra-renal gland. Both kidneys and the remaining abdominal viscera appeared normal, save that closely surrounding the right supra-renal gland was a dense, firm, ovoidal blood-clot, about 4 ctm. long, 3 ctm. wide, and 2.5 ctm. thick. The supra renal gland was itself apparently unchanged, save by pressure, and a considerable infiltration in several places with blood.

Hemorrhage in and about the supra-renal gland is of rare occurrence in adults, but is not very infrequent in the new-born; it is most apt to be one-sided.

As to the cause of these hemorrhages, while they have in the various hitherto described cases been associated with the hemorrhagic diathesis, with leukaemia, with disturbances of the venous circulation, with fatty degeneration and inflammation of the walls of the blood-vessels, and with Addison's disease, our actual knowledge of the causes is actually very meagre.

THE PRESIDENT remembered seeing a case in a child where one supra-renal capsule showed hemorrhages with quite extensive destruction of the gland-tissue. In this case hematoidin crystals were found. A dirty color of the skin attracted attention before death.

DR. FREEMAN presented some specimens and a paper on

COCCIDIUM OVIFORME (PSOROSPERMIA).

This protozoon, which is parasitic of animals, is of interest because it is very common in rabbits, forming nodules, most often in the liver, sometimes in other organs which may be mistaken for tubercles; also because it can produce the same lesion in man and may cause death. The liver is by far the most frequent organ invaded.

In the liver of the rabbit these nodules occur mostly

in the neighborhood of the gall-bladder ; they vary in diameter from microscopic to two or three centimetres. A section through a nodule shows under the microscope a cavity surrounded by connective tissue and lined by spores or psorospermial and by more or less distorted columnar epithelium. From the walls many irregular projections extend into the cavity ; these consist of a connective-tissue framework supporting a large number of spores. Detritus and coccidia lie free in the cavity. The coccidium is an oval shaped body surrounded by a thick membrane and containing a coarsely granular substance, sometimes distributed throughout its interior, sometimes confined to a spherical ball. For the most part the walls of the cavities are lined with spores piled on each other ; between these and the connective tissue one can see sometimes nucleated epithelial cells ; more rarely is the wall lined with apparently normal columnar epithelium. The coccidia are also found in the bile-passages and gall-bladder.

The question of the real significance of these nodules caused much speculation until Remak,¹ in 1845, first noted the resemblance of their contents to psorospermiae.

Leukert² holds that the cavities are developed from bile-passages which have been invaded by the spores, and gradually dilated. The projections into the cavity he explains as the remains of tissue formerly existing between neighboring bile-ducts which have united. The spores, he says, grow within the epithelial cells lining the gall-ducts, and five or six may occupy one cell. Such growth within the cells I have been able to demonstrate when there are but few spores. When there are many spores lining the cavity I find often no trace of epithelium ; sometimes, however, there is a nucleated cell between the spores and the connective tissue. The spores, having reached maturity in the walls of these cavities, become free within the cavities, where they are enveloped in a thick membrane, and take an oval form. A micropyle opening is described at the more pointed end. The contents of the coccidium are granular and at first distributed throughout, but later collected in a spherical body. The coccidia then get into the bile-passages, then into the intestines, and finally are discharged.

After being discharged the contents of the coccidium segregate, forming four bodies which finally become sickle-shaped. The protozoon is now ready to enter a new host. Cultures of this organism have been made in chromic-acid solution, but its period of incubation is not

¹ Diagnostische und Pathologische Untersuchungen. Berlin, 1845.
² The Parasites of Man. Edinburgh, 1886.

yet fixed; results vary from two weeks to months. Animals become infected by taking into their stomachs these coccidia containing the four sickle-shaped bodies. It is thought that the coccidia disintegrate in the stomach, discharging the sickle-shaped bodies, which draw themselves into a ball, and taking on amœboid movements reach the liver through the bile-passages.

The great frequency of the disease in rabbits is noteworthy; in ten consecutive autopsies on rabbits, I found coccidium oviforme nodules in every case. Psorospermiae have also been found in sheep,¹ pigs,² and monkeys.³ They have been described in the lung of a monkey⁴ in nodules looking grossly like tubercle and varying in size from microscopic to miliary.

The first case occurring in man, and recognized as psorospermiae, was that of Grubler, of Paris, reported in 1858. There were twenty tumors in the liver, varying in size from that of a chestnut to an egg. Grubler examined the contents and thought the coccidia were the eggs of distoma, but he failed to find any worms in the intestines.

Leukert recognized its true nature. He mentions its occurrence in man in a case of Dressler, and two cases of Perls, of Giessen, also two cases of Lindemann, one of the kidney and the other of the hair, but as to the correct diagnosis of these latter cases there seems to be some doubt.

Kunstler and Pitres⁵ found coccidia in a pleuritic exudation in man.

The molluscum bodies seen in molluscum contagiosum were thought by Ballinger⁶ to be psorospermiae, but this view is not generally accepted.

Darer, in an article entitled "De la Psorospermose Folliculaire Vigitante"⁷ reports two cases of a characteristic skin disease. In the horny mass under the hair-follicles the author found round cells with double encircling membrane and granular contents and a medium sized nucleus. These he takes to be coccidia; he failed in efforts to cultivate and inoculate; one patient was sick nine years without infecting her husband.

Darer believes that a case reported by Dr. James C. White as keratitis follicularis⁸ is similar to those described by him.

¹ Virchow's Archiv, xxxvii., 431; xli., 283.

² Ibid., xxxii., 356; xxxvii., 255.

³ Mag. f. d. ges. Theilkunde, xxxvii.

⁴ Journal de Micrographie, 1884.

⁵ Tagbl. d. 51 Vers. d. Naturf. u. Aerzte, 1878, p. 159.

⁶ Annales de Dermatologie et de Syphiligraphie, 7, 1889.

⁷ Journal of Cutaneous and Genito-Urinary Diseases, June, 1889.

In conclusion I may mention the pseudo-tuberculosis of rodents. This disease causes nodules in the spleen, liver, kidney, and lung, also enlargement of the lymphatic glands and inflammation of lymph-follicles in the intestine. The lesion has the gross appearance of tubercle, but grows much faster. It was first recognized by Malassez and Vignal,¹ has since been studied by Eberth,² and more recently by Pfeiffer,³ who attributes to it a specific bacillus of which he made cultures and inoculations.

NOTE.—At a meeting of the Pathological Society of London, December 17, 1889,⁴ a specimen of coccidium oviforme of the ureter and kidney occurring in man was presented by Mr. Bland Sutton.

DR. PRUDDEN thought that the paper gave the idea that the disease was more common than it really was. It generally occurred in groups, as in the case recorded, and was found in the animal-houses, especially toward the end of the season, suggesting the spread of the disease from one to another.

DR. FREEMAN said that the animals which he had examined had been but a short time thus exposed, but had come from the same place before this.

DR. H. P. LOOMIS said that he had lately examined a number (forty) of rabbits, and as even their livers showed no such lesion he was inclined to think the disease less frequent than the paper would indicate.

DR. JOHN S. ELV presented some specimens illustrating the

EXTENSION OF TUBERCULOSIS IN THE LUNG BY ASPIRATION.

In 1883 Weigert summed up the prevailing theories regarding the spread of tuberculosis in the body substantially as follows :

I. By direct extension of a tubercular mass in the tissue in which it exists.

II. By mechanical transport of tubercle bacilli in various channels of the body (exclusive of lymph- and blood-vessels), as, for example, through the air-passages during coughing, or in the alimentary tract in swallowed bits of sputum.

III. By penetration of bacilli into lymphatics and transportation in the lymph current.

¹ Archives de Physiologie normale et pathologique, 1883-1884.

² Virchow's Archiv, Bd. 100, S. 15, and Bd. 103, S. 488; also Fortschritte der Medicine, Bd. 3, No. 22.

³ Über die Bacilläre Pseudotuberkulose bei Nagethieren. Leipzig, 1889.

⁴ Lancet, December 21, 1889.

IV. By penetration of bacilli into blood-vessels and dissemination in the blood-current.

The exhaustive study accorded to tuberculosis during the past six years has added nothing to this list.

The specimen which I present this evening exemplifies the second mode of extension of the tubercular process, that by mechanical transport of the bacilli, in this instance through the air-passages. The specimens are sections from the lung of a patient who had for a long time suffered from bronchitis, as the result of which

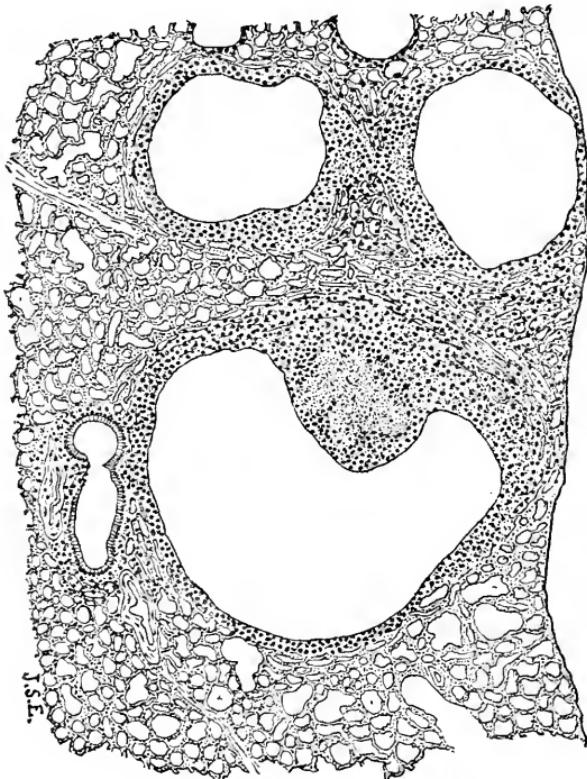


FIG. 6.—Tubercular Mass Growing a into Bronchus.

bronchiectases had formed in the lung. Some of these are visible along one side of the sections. The accompanying cut roughly portrays the topography of a portion of one of the sections.

There is but slight inflammation around the bronchiectases and in the lung-substance. What is especially noteworthy is the entire absence of any tubercular inflammation in the sections, except in the immediate neighborhood of the dilated bronchi. This is in itself significant, but that which renders the proof almost positive that it is

through the bronchial tubes that the extension of the tubercular process has occurred, is a small mass of tubercle tissue on the wall of one of the bronchiectatic cavities. This consists of a collection of small spheroidal cells, in the centre of which cheesy degeneration is apparent. This nodule of tubercular inflammation seems to have developed from the inner surface of the dilated bronchus, and appears to have no connection with any tubercular tissue in the immediate neighborhood from which it might be considered to be an extension. I am compelled to believe it to have resulted from the lodgement of tubercle bacilli upon the wall of the bronchus and their subsequent development there.

It seems to me that this mode of dissemination of the tubercular virus must be very frequent in cases in which an advanced tubercular nodule exists in the lung, for in the forced inspiration immediately preceding a hard cough, many particles of cheesy matter or sputum might readily be aspirated into the bronchial tubes in the neighborhood of the disintegrated lung-tissue.

It has now been my privilege to present to the Society at different times specimens illustrating all the modes of extension of tuberculosis in the body enunciated by Weigert, except the first, that by direct growth of a tubercular mass, which, being self-evident, needs no demonstration.

DR. H. P. LOOMIS presented

A HEART FROM A CASE OF ANGINA PECTORIS,

with the liver showing peculiar whitish-gray patches.

F. G——, aged forty-six, began to suffer with what he called "heart trouble" five years before his death. During four years of this time he was confined to his house two or three weeks at a time at different periods. A year before his death he came under my observation, when he was "water logged;" there was cardiac asystolism, acute pulmonary oedema, and he was suffering almost constantly with severe anginal pains. At my first visit it did not seem possible that he could live more than twenty-four hours.

Nitrite of amyl instantly stopped the anginal pectoris, and Fothergill's pills relieved him, so that by the end of two weeks his oedema had disappeared and he was fairly comfortable. During the past year he was unable to leave his rooms, and most of that time was compelled to assume a sitting posture. He suffered daily from attacks of angina pectoris, which could only be relieved by nitrite of amyl "pearls;" morphine in full doses gave no relief, and nitroglycerine, continued for a long time, did not diminish the number or severity of the attacks.

The patient took during the year over one thousand two hundred of these "pearls," each containing five drops of nitrite of amyl, the last giving him just as complete relief as the first. His heart's action was irregular and intermittent, and physical examination gave the signs of general cardiac hypertrophy and dilatation, with extensive aortic obstruction and insufficiency. His cardiac impulse at times was forcible, but usually feeble and diffuse. His urine contained a moderate amount of albumin, but no casts were ever found; during most of the time his urine contained an excess of uric acid. At times he suffered from excessive anorexia, which could only be relieved by washing out the stomach. Dyspncea and oedema of the feet was never present after the first exhibition of Fothergill's pills. The prominent symptoms of the case, independent of those ordinarily present in valvular lesion with cardiac dilatation, were : First, the constant recurring attacks of angina pectoris; second, the length of time the patient lived after he had developed the symptoms of extensive cardiac insufficiency; and also the fact that his urine at no time showed any evidence of tubercular changes in the kidney. The explanation of the peculiar appearance presented by the liver is a point of special interest.

AUTOPSY, made twenty hours after death.—The heart was the largest I remember ever to have seen—a typical specimen of *cors bovis*. Its weight, after removal from the body, when emptied of blood, was one and three-fourths of a pound. The left ventricle was greatly dilated, with slightly hypertrophied, dense, muscular-looking walls one and one-fourth inch in thickness. The aortic valves were indurated, retracted, and eroded. The aorta, for two inches above its origin, was dilated, exceedingly atheromatous, and covered, in places, with calcareous plates. The right ventricle was extensively hypertrophied and dilated, as were both auricles. Microscopical examination showed moderate interstitial myocarditis, with perfectly normal muscle fibres. The lungs were normal, with the exception of hypostatic congestion in the lower lobes. The liver weighed five and one-half pounds. Scattered throughout its entire substance were whitish-gray patches, varying in size from a pin's head to a small pea. These gave the liver a very unusual appearance, and suggested areas of connective tissue increase, but microscopical examination showed that the only lesion of the liver was excessive passive congestion, and that the white areas were capillary hemorrhages which had torn apart the lower cells. The outline of the red blood corpuscles were very distinct. They had not degenerated. The kidneys were very much enlarged and of normal appearance.

The microscope showed extensive congestion of the capillaries, with a slight breaking down of the free borders of the tubular epithelium in place. There was no connective-tissue increase.

DR. ROOSEVELT called attention to the fact that we find angina with perfectly normal hearts, with the so-called typical lesions and with atypical lesions. He thought that no very definite relation had as yet been demonstrated, and was inclined to think that there must be some constant lesion not as yet known.

DR. LOOMIS also presented a specimen of

SCIRRHOUS CARCINOMA OF THE PYLORUS

which had caused death, but in which the symptoms had been so atypical that a positive diagnosis had not been made.

DR. T. H. MYERS presented a specimen showing

THE RESULT OF HIP-JOINT EXSECTION,

in a child four and a half years of age, nine months after the operation.

The case was one of hip-joint disease, with abscesses, pain, and lack of suitable means for conservative treatment.

In the track of an abscess, by the usual Langenbeck incision, the head of the femur was removed. Abscess cavities were found within it. The limb was fixed as much as possible by the long lateral splint, and extension also applied. In two and one-half months the child was allowed up, and the next month began to bear some weight upon the limb. The joint seemed firm, and no aid was sought by applying the hand to the hip or thigh. The motion in the joint at seven months was very fair indeed. Flexion was especially good, while abduction and adduction were allowed to a slight degree; and though there was this free motion, there was very little telescoping of the joint. The shortening amounted to half an inch only. Dissection shows the lack of telescoping to be due in greatest part to the very well defined upper and posterior border of the acetabulum, which has not apparently suffered from the disease. The ligaments and muscles about the joint, also, have accommodated themselves to the altered anatomical relations, and enclose the joint firmly and closely. It is unfortunate that this cannot now be shown in the specimen presented.

The origin of the ligamentum teres shows a small cartilaginous nodule, probably formed since the operation.

Dr. Lynde, to whom I am indebted for the history of the case, assures me that the neck of the femur is shorter than it was at the time of the operation. It now barely

extends beyond the intertrochanteric lines. The opposing surfaces are now covered with a strong, smooth, fibrinous membrane, and articulate almost smoothly, giving rise to an albuminous crepitation only.

There are still two small circular areas on the femoral neck, covered only by softer granulations; at no point, however, is there any exposed bone, nor is there evidence of any active disease in the joint.

Ollier has lately published¹ the ultimate results in his series of fifty cases of excision of this joint, and it is instructive to note that those cases which recovered with more or less free movement in the joint, though enabled to sit gracefully and conceal their defect more readily, could not stand the long walks and other violent exercise which the ankylosed joints bore with impunity.

The child from whom this specimen was removed died nine months after operation of general tuberculosis. I hope Dr. Northrup, who made the autopsy, will give his opinion as to the relation between the two. Was the hip-joint disease primary or secondary?

THE PRESIDENT said he thought the case a very good one of secondary hip-joint disease, and the best example of cured pulmonary tuberculosis that he had ever seen. The tubercles were present in great numbers in the meningeal lesion, but their origin he had been unable to discover.

The Society then went into executive session.

¹ Bull. Acad. de Med., Paris, 1889, 3 S. xxi., 693.

Stated Meeting, December 13, 1889.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

DR. G. C. FREEBORN presented the following card specimens :

CHRONIC OVARITIS.

A series of six ovaries illustrating chronic ovaritis with the formation of follicular cysts. These ovaries have been removed by laparotomy. A transverse section through a Fallopian tube, showing chronic suppurative salpingitis. Tube measures one and one-fourth inch in diameter. A section through a small multilocular cyst growing from the cyst-wall of a large multilocular cyst of the ovary.

A PRESERVING FLUID.

This specimen had been fixed in Flemming's chromic and acetic acid mixture (one per cent. aqueous solution of chromic acid, 20 parts; two per cent. aqueous solution of hydric acetate, 4 parts; water, 70 parts). The specimen was suspended in one hundred times its volume of the above fluid for forty-eight hours; then washed in water until all color ceased to come away; then hardened in seventy per cent. alcohol. After removing the specimen from the fixing fluid, the walls had the consistency of soft leather, and when the specimen was cut around, the walls of the various cysts did not collapse, but retained their normal position.

From the results obtained with this specimen, and from experiments that are now being made with large cysts, I think this fluid will prove valuable as a preservative for gross specimens of cystic degeneration.

DR. T. M. PRUDDEN wished to call particular attention to the mode of preservation that had been used in these cases, for it was usually a very difficult thing to preserve cystic adenomata of the ovaries well.

DR. PRUDDEN then showed some cultures of one of the forms of

PHOTOGENIC BACTERIA.

A culture on agar-agar, when shown in the darkened room, emitted a phosphorescent light, and a flask of water containing some of the bacteria became luminous when agitated. Several forms of these photogenic bacteria have been isolated and described, some being obtained from phosphorescent fish, and others from crabs. The latter had been shown to be pathogenic.

DR. H. J. BOLDT presented a specimen of
MELANOTIC SARCOMA

removed from the belly of the gastrocnemius muscle of a young man. The tumor had grown very slowly at first, but during the last few months had caused some trouble. The centre of the growth was fluid, and was found to contain blood. The walls of the cyst were melanotic. A large portion of the belly of the gastrocnemius muscle was removed with the tumor, as were also the neighboring glands, which were found to be likewise melanotic.

A second specimen was one of

SARCOMA OF THE UTERUS,

complicated with ovarian tumor. The woman had had hemorrhages for some time. The ovarian growth was first removed and then the uterus. The patient died, and at the autopsy there was found to be chronic interstitial nephritis, and the heart was very small, being no larger than that of a child nine years of age.

DR. H. M. BIGGS presented a specimen of

SHOT WOUND OF THE CHEST

in a child eleven months of age. The child had been shot fifteen days before her death, the bullet entering near the right nipple. It struck a rib and was deflected, passing through the diaphragm and into the kidney. At the autopsy the right lung was found to be completely collapsed, and there was pneumo-thorax, with a fibrinous exudation on the pleura, but without any effusion in the pleuracavity. There was, in addition, a very recent general "miliary tuberculosis." The parietal pleura on the right side contained thousands of miliary tubercles, and there were also tubercles in the brain and other organs. There were no evidences of any old tuberculous process. Although miliary tuberculosis was rare in so young a patient, the speaker had seen it in a child of eleven weeks.

The Society then went into executive session.

Anniversary Meeting, January 8, 1890.

WILLIAM P. NORTHRUP, M.D., PRESIDENT, IN THE CHAIR.

BACILLUS VERSICOLOR.

DR. T. M. PRUDDEN presented a series of test-tubes containing cultures of a new chromogenic bacillus, and made the following remarks :

This bacillus, so far as I am aware, has never been described. I have called it, for reasons which will appear in its description, *Bacillus Versicolor*.

It has been found several times, floating with other micro-organisms, in the dust of the air about New York. But it has been found only in single examples, and in comparison with other aerial organisms is rare. It is a short, round-end bacillus, about 0.75 to 1μ thick, and 1.5 to 2μ long, occurring singly and in pairs.

It fluidifies nutrient gelatine slowly, shows very slight mobility in fluids, and grows best at ordinary room temperature. It is aerobic, and no spore formation has been detected. On solid culture media it forms at first a grayish translucent pellicle, which soon becomes of a marked but dull lemon-yellow color. It develops in all the transparent culture media, at first a pink and then a rich red color. This color gradually permeates the non-fluidifying culture media.

The media in which the red color is thus developed show with the spectroscope two sharply defined absorption bands between D and E, which in situation and appearance are almost identical with the bands of a moderately dilute solution of oxyhæmo-globin. The growth in general is moderately rapid.

On *gelatin plates*, after forty-eight hours, the deep white round or oval colonies are from .1 to .3 mm. in diameter. Under the microscope they appear nearly opaque, but have a greenish-yellow shimmer; the edge is sharp and slightly rough, the surface finely linear granular. The surface colonies, at first translucent and waxy, gradually assume a yellow color, and are slightly raised. They may, in seventy-two hours, become from 2 to 3 mm. in diameter, the surface is slightly wrinkled and cup-shaped from fluidification of the gelatine. In from four to six days the yellow discoidal colonies float about in a pit of turbid fluidified gelatine.

In *agar tubes* the growth on the surface is at first of a translucent grayish-white color, smooth and shining. Later it may spread to from 3 to 5 mm., forming a slightly

raised yellow pellicle. Growth along the puncture-line is moderate.

The red color appears first about the top of the puncture-line, and gradually deepens in hue as it spreads through the agar mass. It is often several days before the red color is markedly developed in the agar. At 37° C. the growth is much retarded.

Glycerine agar tubes show the same characters as agar.

Gelatine Tubes.—A thin yellowish pellicle at first spreads from the puncture and becomes more or less cup-shaped. The growth along the puncture line is slight and diffuse. The gelatine is slowly fluidified, the fluid gradually assuming a rose-red color, as does the zone of solid gelatine about it.

When the fluidification is advanced, a yellow pellicle floats at the surface or sinks in a yellow mass to the bottom of the fluid.

Beef-tea becomes turbid at first, then reddish, with a sediment.

Blood Serum.—Growth similar to that on Agar.

Potatoes.—The growth is moderately rapid, forming a thick, irregular, raised greenish-yellow mass, which gradually becomes darker in color.

Subcutaneous inoculation in rabbits and white mice, even of considerable quantities, produces no appreciable effect.

REMARKS.—There is considerable variation in the rapidity of growth and color-producing power in the different specimens of this bacillus which I have found. Its vigor seems to suffer somewhat under prolonged cultivation.

DR. JOHN S. FLY presented some microscope-slides showing

CILIA ON BACTERIA,

and made the following remarks : Great mobility has long been known to characterize many of the bacteria. From the first this was thought to be due to the activity of cilia on the ends of the bacteria, and in a few large species the truth of this was early demonstrated, but the vast majority of the mobile bacteria have until very recently baffled all attempts to discover their minute locomotive organs, and we have been obliged to infer their existence, without, however, being able to prove it. A new method of staining, introduced by Loeffler, makes the cilia easily visible. Loeffler very ingeniously hit upon the idea of intensifying the coloring power of his dyes by the use of mordants. The mordant recommended is an ink prepared by mixing a solution of tannin, ferrous sulphate, and infusion of log-wood. To 10 c.c. of a twenty per cent. aqueous solution

of tannin, an aqueous solution of ferrous sulphate is added drop by drop until a violet-black color is produced; then 3 or 4 c.c. of an infusion of logwood (1 part logwood, 8 parts water) are added, and finally 5 c.c. of a five per cent. solution of carbolic acid, to render the solution more permanent. This then is the mordant.

The stain is prepared by dissolving 4 or 5 grammes of the dye to be used, preferably fuchsin, in 100 c.c. of a saturated solution of aniline oil in water, to which 1 c.c. of a one per cent. solution of sodium hydrate has been added. This solution is quite permanent, but must be filtered before using.

Having now both mordant and stain, we proceed to employ them according to the following method: The material to be examined is dried on a cover-glass, and fixed by passing through the flame in the usual way. A few drops of the mordant are then added, and gently heated until steam begins to rise. The mordant is then carefully washed off with distilled water, and the stain is added, and heat applied as before. After a few moments the specimen is again washed, and is then ready for examination.

By this method Loeffler has succeeded in staining cilia on all the true spirals, on the comma bacilli of Koch, and of Finkler and Prior, on the mobile micrococcus recently described by Ali Cohen, and on a large number of mobile bacilli. The typhoid bacillus, however, resisted all attempts to stain its cilia. The stain is also well adapted to the staining of micro-organisms in tissues, but is then employed without the mordant.

The drawback to the general use of this method is the intensity with which all albuminous material is stained, often obscuring the bacteria when much is present. To avoid this, bacteria taken from bouillon cultures or from gelatine tubes should be first mixed with a few drops of distilled water to dilute the albuminous bodies present, and a small drop of this then taken for examination.

The specimen which I have is a mixture of many species of bacteria which grew in a hay infusion. There are many bacilli of various sizes, and besides these there are many spirals belonging to the species *spirillum undula*. On the ends of these may be seen cilia, sometimes single, sometimes in small bunches of five or six. Seeing these it is easy to account for the rapid motion of this spiral through the water of the hay infusion. Many of the bacilli in the specimen also show cilia, but these are much smaller and more difficult to see. While the cilia in the *spirillum* are straight, in most of the bacilli they are wavy.

As is but natural, very high powers of the microscope are necessary to render these minute structures visible.

The specimen which you are examining is magnified one thousand diameters.

TUBERCULOSIS OF THE KIDNEY.

DR. H. M. BIGGS presented some specimens with the following history : The patient was admitted to the Charity Hospital, suffering apparently from gastritis. Examination of the urine at that time showed a small quantity of albumin, but this disappeared later. After having recovered from the gastritis he was found to be still very weak and was on that account retained in the hospital. After a while he was seized with intense headaches, for which he could get no relief, gradually sank, and finally died comatose. At the autopsy acute miliary tuberculosis was found, involving especially the lungs and brain, though a few miliary tubercles were seen in other organs of the body. There was absolutely no trace of any old tuberculous process in the lungs, but there was a perfectly characteristic tuberculous process going on in the left kidney, in which were found some cheesy masses, and destruction of the organ had occurred. The ureter on this side had also apparently been destroyed. The other kidney, the bladder, and other portions of the genito-urinary tract were apparently normal. One bronchial gland was found to be cheesy and calcareous. The case was interesting, especially because of the localization of the process in the genito-urinary tract and of the secondary development of tuberculosis in the lungs. The speaker thought that perhaps years ago this man might have had a very slight tuberculous trouble in the lung from which the infection in the kidney took place. Then, during his stay in the hospital, this last process gave rise to general infection, and acute miliary tuberculosis occurred.

ACUTE MILIARY TUBERCULOSIS OF THE PERITONEUM.

Dr. Biggs showed a second specimen of acute miliary tubercular peritonitis, removed from the body of a woman, who had been admitted to hospital for delirium tremens. It was thought that death might have resulted from a rupture caused by intestinal ulcers, but nothing of the kind was found at the autopsy. There was no tuberculous process found in any other part of the body except one small calcareous nodule, perhaps one-third centimetre in diameter in the lung. There was a very recent acute general miliary tuberculosis of the peritoneum. The speaker did not believe that primary tuberculosis of the peritoneum ever occurred ; yet, he said, it was very hard to persuade one's self that the disease could follow such a very small lesion in the lung.

A third specimen shown was one of

PANCREATIC HEMORRHAGE.

It had been removed from the body of an unknown man, who had gone into a saloon and taken a few glasses of beer, then went outside and fell down on the sidewalk dead. At the time the autopsy was made there was considerable decomposition present, and nothing could be found except a hemorrhage around the pancreas and a number of minute hemorrhages within the organ. Not much could be determined concerning the changes in the pancreas, because of the degree of decomposition present. The case was one of sudden death, due to pancreatic hemorrhage.

ANEURISM OF THE BASILAR ARTERY.

This specimen was obtained at an autopsy made with Deputy Coroner Jenkins. The patient was a young man, thirty-one years of age, apparently in perfect health, who went to his work one morning as well as usual. After working for about half an hour he complained to the foreman of severe headache and said he would have to stop. He went down to the lower floor of the house in which he was working, lay on the floor, and died almost immediately. At the autopsy there was found a large hemorrhage at the base and over the convexity of the cerebellum. On injection of the vessels of the base there was found a small aneurism at the side of the basilar artery, just before its bifurcation. The case was interesting because of the rarity of these aneurisms in young persons. Some time ago Dr. Biggs saw another case, with a very similar history, in which the same lesion was found at the autopsy. There was absolutely nothing else in either case to cause death. There was nothing to account for the occurrence of the aneurism, and the speaker was inclined to think that it was due to a congenital weakness of the vessel.

SECONDARY ADENO-CARCINOMA OF THE LUNG.

DR. FRANK W. JACKSON presented a specimen of this lesion, with the following history :

The patient was a man, thirty-two years of age. He was admitted to the Roosevelt Hospital last July, without a definite diagnosis. For two months he had suffered from dyspeptic symptoms, loss of flesh and strength, night-sweats, and, latterly, marked dyspnea. He also had pain in his abdomen when he moved. He considered that he had been in perfect health up to two months before, but it was found that his right testicle had been removed one year before. It was enlarged, but he did not know the nature of the enlargement. Some years before he had been operated upon for fistula in ano. There was no

other history of previous illness, and his family history was good.

When admitted to the hospital it was evident that he was very sick ; he was emaciated and anæmic. His dyspnea was evident, and he had a slight cough. He was under observation for ten days, during which time he simply grew weaker. He had much dyspnea, and from time to time expectorated a peculiarly viscid, jelly-like material of a brick-red color. He had hardly any rise of temperature.

His physical signs were interesting. There was moderate dulness over the bases of the lungs behind, the voice and breathing was found to be diminished over the whole chest, and crepitant and subcrepitant râles were heard all over both lungs. There was a large, hard, tender gland just above the left clavicle, and extending down beneath it. In the abdomen there was felt a hard cylindrical mass, just above the umbilicus, lying transversely across the vertebral column and apparently intimately attached to it. The vertebral bodies seemed very prominent, and the tumor seemed to be of the same consistency with the vertebrae. The difficulties of diagnosis were apparent. He looked like a man with phthisis, and his history of fistula in ano, enlarged testicle, and night-sweats pointed in that direction, while the physical signs in his lung were such as might readily go with chronic miliary tuberculosis. He had, however, no temperature, his cough was not severe, and his expectoration was from time to time peculiar in its brick-red color and gelatinous consistency.

Then there was the tumor in the abdomen to be accounted for. Was it a retroperitoneal growth, and was the enlargement of the testicle of a cancerous nature? Or were there phthisis and carcinosis combined? Some light was thrown upon this after a few days, when it was learned that the enlarged testicle had been examined after removal and found to be carcinoma.

The autopsy showed general carcinosis. There was a very large mass lying upon the vertebral column, and extending from the diaphragm into the true pelvis, involving the retroperitoneal glands and including portions of the intestines and the tissues about the kidneys. This was what I had mistaken for the spinal column itself, and the cylindrical tumor was simply a prominent nodule. Both lungs were infiltrated with cancerous nodules, the pleuræ were adherent, and there was a little bloody fluid in the pleural cavities. There was no phthisis.

The microscopic examination of both the growths in the lungs and in the abdomen show these to be adenocarcinoma.

DR. H. J. BOLDT exhibited a patient who had sustained a

FRACTURE OF THE SKULL

from the kick of a horse. The accident occurred last July. The skull was crushed, and on putting the pieces together subsequently, those from the inner table were found to cover an area of something over two inches in diameter, and those from the outer table one of about one inch. The bone was in fourteen fragments, embedded in the dura mater and in the substance of the brain. Considerable oozing of brain tissue took place for some days after the injury. The pieces of bone were jagged, and some were extracted with considerable difficulty. All foreign matter which could be detected was removed, among other things a piece of a felt hat. There was very profuse bleeding from the nose and ear. There was paralysis of the left side of the face and left upper extremity, but this disappeared in the course of a few weeks, and at present there is remaining only a numbness of three fingers. A piece of the scalp was cut out after the foreign bodies had been removed, in order to give free discharge to any products that might be formed. In all about ten grammes of brain-substance oozed away, after which the scalp was raised and brought together by wire sutures. Dr. Boldt looked upon the hemorrhage as the result of a wound of the dura mater, for he had never seen bleeding from the ear in a case of simple fracture of the vertex without injury to the base. In reply to a question whether there might not have been a fracture of the base, he thought that there was none, for there had been no symptoms of such a condition. The man had been unconscious for about half an hour only.

DR. BIGGS said that it was not very rare to meet with cases of fracture of the base, in which there might be considerable hemorrhage, where the patients remained conscious for some time after the receipt of the injury, or might even not lose consciousness at all, in case the hemorrhage did not continue very long. Not so very long ago he had seen a man who had fallen from his truck, but at first gave no symptoms of any injury whatever. On the following day when he went to get his truck he seemed to be ill, and the foreman told him not to try to drive it that day. The man turned away, walked off the end of a pier, and was drowned. At the autopsy there was found a very extensive fracture of the base of the skull.

DR. VAN GIESON said that it would be interesting to watch this case pretty closely to see whether any symptoms of insanity would develop subsequently. The oozing of brain-matter was from the frontal lobes, and in two

or three cases of this kind seen recently a peculiar form of scoffing or mocking insanity had followed the injury.

DR. BOLDT then presented a specimen of

FIBROID TUMOR OF THE UTERUS

which he had removed by the combined method. The reason why an operation was performed was that the pains from which the patient suffered could not be relieved in any way except by the continued use of morphine. The abdomen was opened and a ligature placed around the pedicle of the tumor, and the latter was then cut off above the ligature. After this the uterus was removed by vaginal hysterectomy. The speaker much preferred this combined method, believing it to be safer, as it removed the danger of infection from the stump.

The Society then went into executive session.

The following officers were elected for the year 1890 :

President : J. West Roosevelt.

Vice-President : H. P. Loomis.

Treasurer : J. H. Hinton.

Secretary : T. L. Stedman.

Editor : G. C. Freeborn.

Committee on Admissions and Ethics : W. P. Northrup, H. P. Loomis, R. H. Sayre, J. S. Ely, and R. G. Freeman.

Committee on Publication : T. M. Prudden, and W. B. James.

INDEX.

- ABSCESS of the scalp in an infant, followed by thrombosis of the longitudinal sinus, 70
Absence of the septum auricularum, 52
Accessory apparatus, improvements in, 77
Acute miliary tuberculosis, 38, 39
 yellow atrophy of the liver, 39
Adenoma of the ovary, 61
Adeno-carcinoma of the lungs, secondary, 107
Adherent pericardium in a child, 51
Angina pectoris, 97
Aneurism of the aorta with erosion of the trachea, 65
 of the basilar artery of the brain, 107
 of the mitral valve, 49
Aneurisms, multiple, of the large vessels, 50
 miliary, of the brain, 57
Aorta, aneurism of, with erosion of the trachea, 65
Apoplexy of the ovaries, 50
Arrest of development of one kidney, 17
- BACILLUS versicolor, 103
Bacteria, cilia on, 104
 method of staining cilia on, 104
 phosphorescent, 102
 photogenic, 102
Basilar artery, aneurism of, 107
Bile duct and pancreas, carcinoma of, 23
 primary carcinoma of, 18
 primary carcinoma of, encroaching on pyloris and liver, 22
Bladder, double, 58
Brain, gummy tumor of, 14
 hemorrhage into right ventricle of, 76
 Meynert's basal section of, 66
 round-cell sarcoma of, 91
Broncho-pneumonia, 80
- CALCIFICATION of the mitral valve, 76
Calculi, uric acid, 9
Calculus in the kidney, 11
Carcinoma of the cervix uteri, 15
 colloid, of the gluteal region, 67
 fibro-, of the female mamma, 16
 of the male mamma, 76
 medullary, of the liver, 41
 primary, of the bile-duct, 18
 primary, of the bile-duct, encroaching on the pyloris and liver, 22
 of the pyloris, 99

- Carcinoma of the stomach, with tuberculosis of various organs, 83
 of the uterus and ovaries, 28
- Cervix uteri, carcinoma of, 15
- Chemical examination of mummified foetus, 89
- Chloroform water as a preservative of echinococcus cysts, 9
- Chronic diffuse nephritis with contracted kidney in a child, 41
 orchitis, 44
 ovaritis, 101
- Clamp for the microtome, 77
- Coccidium oviforme, 92
- Colitis, croupous, 6
- Colloid carcinoma of the gluteal region, 67
- Colon, congenital narrowing of, 60
- Committee on Microscopy, Reports of, 6, 18, 49, 69
- Congenital narrowing of the colon, 60
 occlusion of the duodenum, 4
- Corrosion preparations, methods of making, 53
- Croupous colitis, 6
- Cyst of the head of the pancreas, 23
 of the kidney, 11
- Cystic degeneration of the kidney, 13
 duct, impaction of gall-stones in, 14
 ovaries, 1
- Cystoma, ovarian, 28
- Cysts, echinococcus, of the liver, 7
- DILATATION of the aorta diagnosed as aneurism, 49
 of the heart with but slight hypertrophy, 49
- Diphtheria, general tuberculosis, and pneumonia, 67
 of the pharynx and oesophagus, 36
- Diphtheritic membrane in the stomach, 7
- Dissemination of tubercle bacilli, 71
- Diverticulum of the ileum, 30, 60
 Meckel's, 30
- Double bladder, 58
- Ductus arteriosus, patent, 57
- Duodenum, congenital occlusion of, 4
- ECHINOCOCCUS cysts, chloroform water as a preservative of, 9
 of the liver, 7, 78
- Empyemic sac, unilocular, 66
- Encysted trichinæ, 77
- Endocarditis, malignant, 29
- Enteritis with swollen Peyer's patches and enlarged spleen, 36
- Enteroliths, 32
- Epididymis, tuberculosis of, 43
- Epithelioma of the penis, 43
- FRACTURE of the skull, 108
- Fibroma of the uterus, 15, 109
- Fibro-myoma of the uterus, 61
- Fibro-sarcoma of the uterus and liver, 2
- Foreign body in the larynx, 9
- Fœtuses, mummification of, 85
- GALL-STONE, impaction of, in cystic duct, 14
- Gangrene of the vermiciform appendix, 16
- Gastritis, acute, after the administration of turpeth mineral, 34, 35
 acute ulcerative, and nodular enteritis, after diphtheria
 and the administration of turpeth mineral, 35
- Genital organs, tuberculosis of female, 13

- Gonorrhœal salpingitis, 61
Gizzard of a fowl, three pins in the wall of, 14
Gummata, miliary, of the lungs, liver, spleen, kidneys, and lymphatics in a child, 27
Gummy tumors of the brain, 14
Gun-shot wound of the chest, 102
- HAIR-BALLS from the stomach of a cow, 32
 from the stomach of a pig, 32
 from the stomach of a woman, 32
Heart, chorda tendinæ stretching across the left ventricle of, 49
 dilatation of, 49
 lesions and malformations of, 49
Hemorrhage, intracranial, in a child, 38
 into the pancreas, 106
 into the right ventricle of the brain, 76
 into the supra-renal capsule of a child, 92
Hip-joint exsection, 99
Hydrocele, suppurative, 46
Hypertrophic cirrhosis of the liver, 78
Hyper trophy of the middle lobe of the prostate gland, 46
 of the prostate gland, cystitis, and pyelo-nephritis, 45
 of the tunica vaginalis in a case of hydrocele, 43
- ILEUM, diverticulum of, 30, 60
Incomplete ventricular septum, 81
Insanity following oozing of brain matter, 109
Interstitial myocarditis, 57, 58
Intestine, internal strangulation of, 33
 pigmentation of, 34
 tuberculosis of, 31
 typhoid ulceration of, 29
Intracranial hemorrhage in a child, 38
Intussusception, Nothnagel's experiments, 5
Iris diaphragm for Abbe condenser, 77
- JEJUNUM, stricture of, 32
- KIDNEY, arrest of development of one, 17
 calculus in, 11
 cyst of, 11
 cystic degeneration of, 13
 miliary gummata of, 27
 tuberculosis of, 105
Koch's lamp for microscopical work, 25
- LARYNX, foreign body in, 9
 injury to, from electric light wire, 81
Lesions and malformations of the heart, 49
Liver, acute yellow atrophy of, 39
 fibro-carcinoma of, 2
 echinococcus cysts of, 7, 78
 hypertrophic cirrhosis of, 78
 medullary carcinoma of, 41
 multiple cavities in, from post-mortem decomposition, 25
Loeffler's stain for cilia on bacteria, 104
Lungs, miliary gummata of, 27
 secondary adeno-carcinoma of, 107
Lymph nodes and lymph nodules, 62
Lymphatics, miliary gummata of, 27

- MALE mamma, carcinoma of, 76
 Malignant disease of the upper part of the rectum, 34
 Malignant endocarditis, 29
 Mamma, fibro-carcinoma of, 16
 Meckel's diverticulum, 30
 Medulla, cheesy mass in, 69
 Methods of making corrosion preparations, 53
 Middle cerebral artery, thrombosis of, 69
 Miliary aneurisms of brain, 57
 Miliary tuberculosis, general, 102
 Mitral valve, aneurism of, 49
 calcification of, 76
 Multiple aneurisms of the large vessels, 50
 cavities in the liver from post-mortem decomposition, 25
 ulcers of the stomach, 47
 Mummified foetuses, 85
 Meynert's basal section of the brain, 66
 Myocarditis, interstitial, 57, 58

 NECROSIS of the pancreas, 79
 Nephritis, chronic diffuse, with contracted kidney in a child, 41
 Neuroglia, Weigert's stain for, 77
 Nothnagel's experiments in the production of intussusception, 5

 OCCLUSION, congenital, of the duodenum, 4
 of the ureter by a carcinomatous mass, 15
 CEsophagus and pharynx, diphtheria of, 36
 Orchitis, chronic, 44
 Osteomyelitis, acute, following tubercular arthritis, 28
 Ovarian cystoma, 28
 tumors, difficulty in diagnosing, 1
 Ovaries, apoplexy of, 50
 cystic, 1
 and uterus, carcinoma of, 28
 Ovary, adenoma of, 61
 tuberculosis of, 13
 sarcoma of, 28

 PACHYMENTINGITIS hæmorrhagica, 57
 Pancreas, carcinoma of, 23
 cyst of the head of, 23
 necrosis of, 79
 Pancreatic hemorrhage, 106
 Patent ductus arteriosus, 57
 Penis, epithelioma of, 43
 Perforation of the rectum, 34
 of the vermiciform appendix, 63
 Pericarditis with effusion in a chicken, 38
 tubercular, 51
 Pericardium, adherent, in a child, 51
 tuberculosis of, 50
 Peritoneum, acute miliary tuberculosis of, 106
 Peritonitis, tubercular, 13
 Pharynx and oesophagus, diphtheria of, 36
 Phosphorescent bacteria, 102
 Photogenic bacteria, 102
 Pigmentation of the intestine, 34
 of Peyer's patches, 30
 Pleurisy, tubercular, 51
 Pneumonia, diphtheria and general tuberculosis, 57
 Preserving fluid for cysts, 101

- Proctitis, tubercular, 31
 Prostate gland, hypertrophy of the middle lobe of, 46
 hypertrophy of, with cystitis and pyelo-nephritis, 45
 Psorospermiae, 92
 Pulmonary artery, four segments to the valve of, 53
 Pyelo-nephritis with hypertrophy of the prostate and cystitis, 45
 Peyer's patches, pigmentation of, 30
- RAREFYING osteitis of the tibia, 65
 Rectum, malignant disease of, 34
 perforation of, 34
- SALPINGITIS, gonorrhoeal, 61
 Sarcoma, fibro, of the uterus and liver, 2
 giant-cell, of the tongue, 57
 melanotic, of the abdominal walls, 102
 of the ovary, 28
 round-cell, of the brain, 91
 of the uterus, 102
 Scorbutus in an infant, 66
 Septum auriculorum, absence of, 52
 Skull, fracture of, 108
 syphilitic disease of, 83
 Spleen, a minute, 80
 miliary gummata of, 27
 Stomach, diphtheritic membrane, in 7
 multiple ulcers of, 47
 Strangulation of the intestine, internal, 33
 Stricture of the jejunum, 32
 Sudden death, foreign body in the larynx the cause of, 9
 Suppurating hydrocele, 46
 Supra-renal gland of a child, hemorrhage in, 92
 Syphilitic disease of the skull, 83
- THROMBOSIS of the middle cerebral artery, 69
 of the longitudinal sinus, following abscess of the scalp, 70
 Tibia, rarefying osteitis of, 65
 Tongue, giant-cell sarcoma of, 57
 Trichinæ, encysted, 77
 Tuber bacilli, dissemination of, 71
 of a vein, 71
 Tubercular peritonitis, 13
 pleurisy and pericarditis, 51
 proctitis, 31
 tissue from a joint, 37
 Tuberculosis, acute miliary, 38, 39
 of the peritoneum, 106
 of an artery, 71
 of the epididymis, 43
 of the female genital organs, 13
 general, 69
 diphtheria and pneumonia, 67
 miliary, 102
 of the intestine, 31
 of the kidney, 105
 methods of extension, 95
 of the organs with carcinoma of the stomach, 83
 of the ovary, 13
 of the pericardium, 50
 primary, of the genito-urinary tract, frequency of, 84

- Tuberculosis, of the uterus, 13
 of the vermiciform appendix, 32
- Tumors, gummy, of the brain, 14
- Tunica vaginalis, hypertrophy of, 43
- Turpeth mineral as a cause of acute gastritis, 34
- Typhoid fever without enlargement of the mesenteric glands, 81
- ULCERATIVE gastritis, following diphtheria and the administration of turpeth mineral, 35
- Ulceration, typhoid, of the intestine, 29
 of the vocal cords, following measles, 12
- Uric acid calculi, 9
- Ureter, occlusion of, by a carcinomatous mass, 15
- Uterus, fibroma of, 109
 fibroma of, and carcinoma of the cervix, 15
 fibro-myoma of, 61
 fibro-sarcoma of, 2
 sarcoma of, 102
 and ovaries, carcinoma of, 28
 tuberculosis of, 13
- VALVE of the pulmonary artery, four segments to, 53
- Ventricular septum, incomplete, 81
- Vermiform appendix, gangrene of, 16
 grape-seed in, 81
 rupture of, 63
 tuberculosis of, 32
- VOCAL CORDS, ulceration of, following measles, 12
- WEIGERT's stain for neuroglia, 77

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